DEFENSE INDUSTRY BULLETIN

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PRESIDENT HAILS ARMED FORCES

This issue of the DEFENSE INDUSTRY BULLETIN goes to press as Servicemen and women everywhere prepare to celebrate their annual day on May 15. The text of President Johnson's statement on the occasion of this year's Armed Forces Day is reproduced below.

Our country today is stronger militarily than at any other time in our peacetime history. Our strength of arms is greater than that ever assembled by any other nation.

The successful execution of all our policies depends upon the ability to retain the talent and fitness of the outstanding men and women in the military services. Those who serve their country in the Army, Navy, Air Force, Marine Corps and Coast Guard, from whom we ask so much, are the cornerstone of our military might. Their contribution to our freedom and security is beyond measure.

As Commander-in-Chief, I join all of my fellow Americans in high tribute to our servicemen and women on Armed Forces Day, 1965.

DEFENSE INDUSTRY
BULLETIN

Published by the Department of Defense

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The purpose of the *BULLETIN* is to serve as a means of communication between the Department of Defense (DOD) and its authorized agencies and defense contractors and other business interests. It will serve as a guide to industry concerning official policies, programs and projects, and will seek to stimulate thought by members of the defense-industry team in solving the problems that may arise in fulfilling the requirements of the DOD.

Material in the *BULLETIN* is selected to supply pertinent unclassified data of interest to the business community. Suggestions from industry representatives for topics to be covered in future issues should be forwarded to the Business & Labor Division.

The *BULLETIN* is distributed each month to the agencies of Department of Defense, Army, Navy, and Air Force, and to representatives of industry. Request for copies should be addressed to the Business & Labor Division, OASD/PA, Room 2E813, The Pentagon, Washington, D.C. 20301, telephone, OXford 5–2709.

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NADGE Program Nears Procurement Contracting and Installation Phase

Development of the operational and technical characteristics of the NATO Air Defense Ground Environment System (*NADGE*) is completed, the Department of Defense has announced, and this program is now moving into the procurement, contracting and installation phase.

This large electronics complex has been funded under the NATO Infrastructure program at a total cost of $308 million. The U.S. share of this is $95 million, all of which will be spent in this country. Several companies have already announced their desire and capability to take on the job of weapon system consortium manager for the production and installation of NADGE.

To provide a single focal point in DOD for NADGE matters, the Secretary of Defense has designated the Assistant Secretary of Defense (Installations & Logistics) as the office of primary responsibility for the NADGE program. Within OASD (I&L), the Directorate for International Programs, headed by Mr. Donald S. Cuffe, OXford 7–5981, is the action office. Mr. William C. Kruse, OXford 5–3460, and Colonel John P. Healy, USAF, OXford 5–9341, are the action officers.

To assist in the management of the program, the U.S. Air Force has been designated the agency to provide, on behalf of the DOD, technical and administrative assistance to U.S. NADGE contractors. The Office of the Director of Production, Hq, USAF, headed by Colonel Walter E. Kelly, OXford 7–9876, is the Air Force action office.

The Office of the Defense Advisor, U.S. Regional Office for NATO Affairs, NATO Building, Paris, France, represents the U.S. on the NATO committees and panels handling NADGE, and provides the overseas representation and point of contact for U.S. contractors.

Industrial Security Office Opens in Columbus, Ohio

The new Defense Industrial Security Clearance Office (DISCO), which will provide for consolidation of industrial security clearance functions previously performed at more than 100 locations throughout the country, was opened March 8, 1965, in Columbus, Ohio.

DISCO will assume responsibility for clearing defense contractor employees who require access to classified information which are now processed by the three Military Services.

When the DISCO was opened on March 8 only the security clearance workload of the Defense Contract Administration Region, Philadelphia, was taken over.

During the next three months the workload for industrial clearances, nation-wide, will be turned over to DISCO in increments. By the end of June, all personnel industrial security clearances will have been taken over from the Military Services and centered in DISCO. At that time, all defense contractors will be dealing directly with DISCO for security clearances of personnel.

Contractors will continue to deal with their present cognizant security offices and operate under the revised Industrial Security Manual until they are advised by their cognizant security offices to submit clearance requests to DISCO in Columbus, Ohio. Thereafter, they will deal directly with DISCO on personnel clearance matters.

Establishment of DISCO is part of the Department of Defense plan to consolidate in 1965, under the central management of the Defense Supply Agency, organizations of the Military Departments engaged in contract administration services.

The new office will be directed by Colonel Lachlan M. Sinclair, USA.

AF Management of Engineering Data

by

Lt. Col. William O. Rennhack, USAF

A fundamental principle of management is that proposed improvement, or any changes, must be based on a *need*. This need must be soundly based on facts supporting the need. Having established the need, alternative courses of action to fulfill it must be analyzed on the basis of cost versus the effectiveness of each proposed course.

If there ever was a *need* in the military complex, it was the need for a disciplined attack on the defense paperwork jungle. This came to a head, after a tidal wave of industry criticisms, at the Air Force Systems Command's (AFSC) Monterrey Conference in May 1962. General Schriever, Commander, AFSC, recognized the importance of this deficiency and responded by chartering the Data Management Working Group. The new concepts developed by this group which changed the previous procedures were based on *need*. The sheer volume of paper had to be stopped. A selective procedure for limited acquisition of essential data was adopted. No longer could the government afford the luxury of buying all data to support all missions on all contracts.

Lt. Colonel William O. Rennhack, USAF
Data Management Officer
Hq., Air Force Systems Command

During the past three years, the Air Force has made extensive studies of their technical data requirements. This included costs, improved techniques of preparing data and an analysis of user need. Data review boards were formed to insure that only minimum requirements were placed on contract. The most frustrating problem was the infinite varieties of source documents for acquiring data. Data was called for in ASPR clauses in the general provisions of the contract, narratively interspersed throughout the work statement of the contract and, of course, referenced in endless supporting specifications, exhibits, etc.

In March 1964, the Air Force published the 310–1 series of manuals and regulations which established control of Contractor Furnished Data. Requirements for data had to be listed on a DD Form 1423 and selected from an Authorized Data List (Vol II of AFSC/AFLC Manual 310–1). This technique gave instant visability to the myriad of data requirements. The authorized Data List contains some 300 discrete items of data in 13 categories. Each data item states the requirement. It is not a registry of acceptable specifications, or an abstract which calls out a list of supporting applicable documents. Each data item is a specification for data only. When this authorized Data List was prepared, rather than go to the functional area of primary responsibility and ask them what data should be listed, the Systems Program Director was asked, "What data do you need to do your job?" After reviewing some 9,000 detailed data requirements in documents, only 300 are now considered necessary for standard application.

Contractors are just as anxious to reduce the delivery of paper as the Government. Some have estimated that the weight of the paper delivered in the past has exceeded the weight of the product. The heart of a contractor's system for controlling the development and production of his product is the engineering control and release procedure. Control of drawings are a major portion of this procedure. Drawings are not only diagrams but are actually an intelligence bank for control and communication of the configuration, its materials and methods of manufacture. For example, they state processes, tolerances, manufacturing techniques and also reference applicable specifications and other vital information.

Literally millions of drawings are required to document our current weapons systems. The storage and retrieval by the Government of this data is often unnecessary, impractical and virtually impossible. It has been conservatively estimated that, to document existing military hardware, stacks of full size drawings 12 feet high would be required which would cover approximately 40 square miles. Even microfilming of these drawings does not solve the basic issue and indeed gives increased problems of visibility and legibility. The key to the problem is *need*. The government should acquire only specific types of drawings to meet precise needs.

The Engineering Drawing category in the Authorized Data List contains 18 data items. These can be selected as needed by the data manager and placed on the DD Form 1423. These data items supersede the requirements of MCP 71–77 which will become obsolete. One of the most important features of the new data items is that they do not necessarily require *delivery* of the data. For example, by placing "E–2" on contract requires the preparation of drawings in accordance with MIL–D–70327. If the contractor has a drawing practices manual which implements 70327, E–2 tells the contractor that the drawings he prepares for his own use are acceptable to the Air Force.

In the past, the Government had to acquire the drawings in order to establish "rights" for the design information when developed at Government expense. In May 1964, Defense Procurement Circular #6 was published which divorced "rights" from "requirements" for data. In effect, the Government did not have to get delivery of drawings in order to establish rights for the drawings which disclosed design information.

Reprocurement Data is one of the most controversial issues which has chronically plagued the Government. One problem, of course, is to clearly identify those items which were developed at Government expense versus those which were developed at private expense or procured from vendors at private expense. Many times the distinction is unclear especially when data contains processes and techniques applied generally across the contractor's product. The Air Force has no intention of acquiring data delivered with limited rights and using it for reprocurement. On the other hand, every effort will be made to get a reprocurement data package for those products where the Government funded the R&D effort. Competitive reprocurement can be expected when the design has been established and follow on quantities can be produced by a responsive industry.

General Bradley, Commander, Air Force Logistics Command (AFLC), has fought the paper mountain for many years. He is particularly concerned about adequate reprocurement data. AFLC Pamphlet 70–2, "Competition with Confidence," explains his position. Data Item P–14 gives the contractor a voice in determining the method by which components should be procured. MIL–STD–789 will implement this concept for all the services.

With a clear forthright data procedure, the Air Force can

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Defense Contract Administration Unified

For those industries who do business with the Government, life in 1965 will steadily become easier.

This is the prediction of the Contract Administration Services (CAS), which got its start in June 1964 as the unified Government organization to deal with contractors in administration of assigned contracts. Constituting a separate but parallel mission within the Defense Supply Agency (DSA), the CAS will operate in coordination with the Agency's other missions in supply and service management and the administration of assigned defense programs.

This new organization and concept came into being when Secretary of Defense Robert S. McNamara directed that a study be made for the purpose of determining how field contract administration was being performed and what could be done to improve it. Called Project 60, the study had the following three objectives:

1. Improve management of contracts in the field.
2. Decrease operating costs.
3. Minimize Government controls over industry.

Detailed observation and analysis of the administration of contracts in the field were made by a joint task force over a period of about a year. Then a report was submitted to the Secretary of Defense which outlined three steps for improving the performance of contract administration services as follows:

1. Certain immediate improvements within the framework of organizations as they then existed.
2. Consolidation of contract administration services in regions throughout the United States.
3. Expansion of consolidated contract administration services for major weapons systems plants, susceptible to administration by such an organization.

The Secretary of Defense approved the first two recommendations and announced a pilot test would be initiated in a five-state region with headquarters at Philadelphia and the formation of a national planning group for nation-wide consolidation. He directed that the third recommendation be indefinitely deferred.

Detroit CAS Region Established

The Detroit Contract Administration (CAS) Region was established on April 1. It will perform contract administration on defense contracts in the state of Michigan with headquarters at 1580 East Grand Boulevard, in Detroit.

The principal organizations consolidated into the Detroit CAS Region are the Detroit Army Procurement District, Detroit Air Force Contract Management District, Detroit Navy Inspector of Material and the Grand Rapids Air Force Contract Management Office. Colonel W. E. Besse, USA, is the Director of the Detroit Region.

Detroit is the second CAS Region to be established in the United States of the eleven planned. The Philadelphia Region, covering the five-state area of Delaware, Maryland, southern New Jersey, most of Pennsylvania, Virginia, West Virginia and the District of Columbia, was consolidated last year.

The new concept began to take hold in June 1964 with the

(*Continued on Page* 17)

Tools for the Man in the Sea

by

Captain Lewis B. Melson, USN

Capt. Lewis B. Melson, USN
Director, Naval Applications Group
Office of Naval Research

Last summer four Navy divers lived for 11 days in a 40-foot long chamber at the bottom of the ocean 30 miles off Bermuda at a depth of 193 feet. Not only did the men make their home in the chamber called SEALAB I but they emerged periodically each day to perform various tasks in the surrounding area. Never before had divers worked for such long periods in water as deep as this. Yet SEALAB I was only the first phase of a long-range experimental program conducted by the Office of Naval Research which is expected to make it possible eventually for divers to work and live at a depth of 1,000 feet and conceivably at even greater depths.

Late next summer SEALAB II will take place one mile off La Jolla, Calif., in 250 feet of water. This time two 10-man teams of divers, which may include civilian as well as Navy personnel, will inhabit SEALAB II, a 50-foot structure, for periods of 15 to 30 days. A major objective will be to determine how much useful work can be accomplished in the ocean environment at that depth.

The SEALAB is now part of the Man-in-the-Sea effort of the new Deep Submergence Systems Program in the Navy's Special Projects Office. It is part of the objective of developing deep sea salvage and submarine rescue facilities. At the present time, such work is restricted by the fact that at depths below 100 feet only a few minutes work requires long periods of decompression. Obviously, this severely limits the amount of work that can be accomplished in one day. The length of undersea time available to a diver is also limited by the amount of breathing gas carried in his SCUBA tanks. The deeper he goes, the more rapidly he uses up the supply in his tanks. In the SEALAB concept the diver lives in a home placed at the depth at which the work is to be performed. This allows him to draw on an unlimited supply of breathing gas and he does not have to be concerned with decompression until the job has been completed.

Although the SEALAB concept overcomes the major difficulties in attempting to extend the capabilities of divers to work at considerable depths for extended periods of time, there are still the problems of how much and what kind of work the diver can accomplish at such depths. In particular, special tools must be devised if the diver is to perform tasks that will make worthwhile the effort and expense required to place him down there in the first place.

First of all, the buoyancy of the water counterbalances gravity to such an extent that the diver has to operate much like an astronaut out in space working on the outside of his space vehicle. In fact, the diver has a greater problem since he must contend with the density of the water while the astronaut has no pressure on him at all. Basically, however, the gravity effect is quite similar. Unless he can see or stand on the ocean bottom, he has no orientation and literally does not know which end is up. Any violent movement on his part, such as associated with cutting, pounding, or twisting will tend to propel him away from his work. If a tool he is using slips from his grasp, it will float away (in contrast to space where anything that is let loose will stay put). If the diver uses lines to attach the tools to himself, the lines can become entangled.

The diver is also handicapped by poor visibility and, in some cases, will have to work in pitch blackness. In such circumstances lights are of little assistance and the backscatter is likely to blind him. Another problem for the diver is undersea currents, which are tricky and unpredictable. In the increased density of the deep sea environment even slow currents apply great pressure and are equivalent to being pushed by a 700-mile-an-hour wind. Just the act of trying to position himself to go to work becomes a difficult chore. Magnets on his feet may help if there is some sort of solid metal platform available on which to work. Even standing on the ocean bottom is only possible if it is firm enough and not loose, mucky sediment which can be as dangerous as quicksand.

Any tools to be developed for undersea work must be designed with these conditions in mind. They must be simple and versatile so that any tool kit carried by the diver can be manageable in size. They must be resistant

SEALAB I aquanaut securing the entry hatch which leads to the oxygen-helium atmosphere lowering operation off the Bermuda Coast in July 1964.

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American Business and U.S. Government Cooperate in $6 Billion Military Export Market

Mr. Henry J. Kuss, Jr., Deputy Assistant Secretary of Defense for International Logistics Negotiations, reports that our sales of military equipment to our Allies have reached $6 billion during the past four years and that the military export program will probably provide a total of $10 billion of military equipment through the sales route by the end of 1971.

The principal countries involved in the $6 billion of past sales are reported as follows: Italy, Germany, United Kingdom, Australia and Canada $4.4 billion; Austria, Belgium/Luxembourg, Denmark, France, Netherlands, Norway, Spain, Sweden, Switzerland and NATO organizations $1.1 billion; India, Iran and Saudia Arabia and other Near East countries $0.3 billion; Japan and New Zealand $0.3 billion; 20 or more other countries—about $0.3 billion.

In pursuing a vigorous program of encouraging such exports of strategic materials and equipment to friendly foreign governments, the United States serves three important needs.

- The first is to strengthen our Allies, militarily, consistent with our own political-economic objectives.
- The second is to promote cooperative logistics and standardization with our Allies.
- The third is to offset the current unfavorable balance of payments resulting, largely, from U. S. military deployments abroad. How effective military exports have been in this respect is shown by the fact that with a rise of such exports to 41% of our defense expenditures abroad last year, the net adverse effect of such expenditures was reduced from a high of $3 billion in 1961 to $1.7 billion.

"Nevertheless," Mr. Kuss stresses, "the challenge of this market makes present American competition mild by comparison, and demands unique qualifications. These include men of strong motivation, high initiative and intelligence, plus adequate financing."

Thus far the potential for this market has not been reached. Estimates indicate that this could go as high as $5.5 billion over the next three years alone. This potential is being further enlarged by the vast sums—between $3 and $4 billion in 1965, for example—being spent on research to develop potentially exportable military equipment. In contrast, the United Kingdom will spend $400 million, Germany $180 million and France $175 million.

Dr. Eugene G. Fubini, Assistant Secretary of Defense (Deputy Director of Research & Engineering), recently stated that 21 current research programs conducted under this plan give strong promise of breakthrough.

Needed: A New Breed of Management

The most critical factor bearing on the success or failure of the military export program is the development of highly qualified executives possessing what Mr. Kuss calls "a very high I^3 rating."

"A high 'I^3' rating," he explains, "designates the combination of strongly developed senses of initiative, intelligence and insight. Of the three, insight is the most essential ingredient." All the men who assist him in administering the military export program, Mr. Kuss pointed out, rate exceedingly well on the "I^3" scale. These men are:

- Leonard D. Dunlap, Mr. Kuss' deputy. He often acts as head of the office in place of Mr. Kuss since travel is a necessity to maintain a high "I^3" rating.
- Leonard A. Alne, Director of Red Negotiating Team. He is responsible for international logistics negotiations in Japan, Canada, Taiwan, Sweden, Denmark, Norway, Thailand, Burma, Australia, Malaysia, South Africa, France, New Zealand and NATO.
- Hugh J. Gownley, Director of White Negotiating Team. He is responsible for all aspects of our German cooperative logistics program.
- Frank J. Fede, Director of Blue Negotiating Team. He is responsible for Italy, Spain, Argentina, Brazil, Chile, Mexico, Venezuela, Peru, Colombia, Ecuador, Belgium, Netherlands, and miscellaneous countries worldwide.
- Peter E. Feigl, Director of Gray Negotiating Team. He is responsible for the United Kingdom, Switzerland, Austria, India, Israel, Lebanon, Saudi Arabia, Turkey, Iran, Iraq, Jordon, Greece and Pakistan.

In addition to the members of his own staff, Mr. Kuss also looks to three Military Service organizations for their assistance in implementing their portions of the military sales program on a world-wide basis:

- As Director of International Logistics, Office of the Deputy Chief of Staff for Logistics, Department of the Army, Brigadier General Howard K. Eggleston is responsible for the Army portion of the military sales program on a world-wide basis.
- In the Air Force, Colonel George Johnson, Assistant for Mutual Security, Office of the Deputy Chief of Staff, Systems & Logistics, directs the Air Force portion of the Military Assistance Program, both with respect to Grant Aid and military sales.
- Captain B. D. Claggett, Director of the Materiel and International Logistics Division in the Office of the Chief of Naval Operations, directs the Navy's foreign military sales and international logistics programs.

Each of the above directs the sales activities in his department and is responsible for harnessing its resources to the military export program.

Adequate Financing Essential—and Available

Few corporations are anxious to shoulder the cost of production without progress payments in advance of delivery. About 70% of the potential military export orders, Mr. Kuss notes, is covered by such pay-as-you-go financing.

Another 20% of the orders need credit assistance of a short- or medium-term nature. For some nations this is to let them defer payment until after delivery; others need credit assistance in order to defer payment from one fiscal year to the next. Much of this may be obtained through private banks and the U. S. Government.

About 10% of those orders included in the estimate of the next five years' potential will need medium- to long-term financial credit from sources other than private banks. Congress has authorized such credit to be administered through the Defense Department when not available from other sources. During the next 10 years it is anticipated that such credit may reach $1.5 billion. However, these guarantees will be issued for military sales deemed solely to be in support of U. S. foreign policy and, with respect to developing countries, where the payments required in the sales agreement will not unduly interfere with that nation's economic development. Fees and premiums in connection with these credits will be adjusted in keeping with the customer-nation's financial risk status and the U. S. foreign policy considerations involved.

In general, U. S. Government financial guarantees will be rendered for sales by a U. S. exporter directly to an

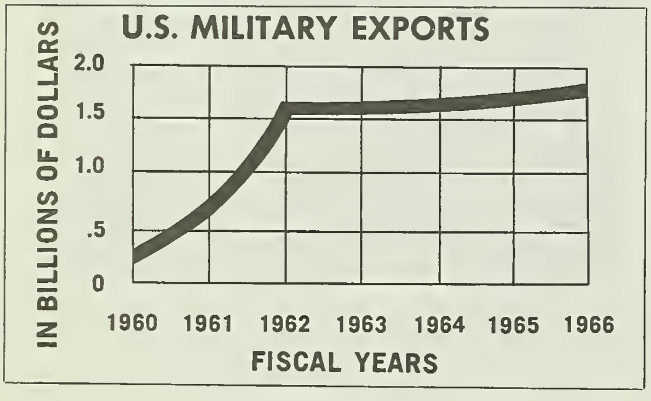

TABLE I
SHORT TERM SALES GOALS
(IN MILLIONS — BY FISCAL YEARS)

	ACTUAL SALES			POTENTIAL SALES			TOTAL POTENTIAL
REGIONS	1962	1963	1964	1965	1966	1967	1965-67
EUROPE	$1405.8	$1342.8	$1088.2	$1453.6	$1297.0	$1274.1	$4024.7
NEAR EAST, SOUTHEAST ASIA, AFRICA	5.3	75.4	61.9	263.5	154.5	159.5	577.5
FAR EAST	104.5	104.9	262.1	138.1	171.6	170.6	480.3
WESTERN HEMISPHERE (includes Canada)	57.6	53.7	115.0	76.5	164.7	113.0	354.2
	$1573.2	$1576.8	$1527.2	$1931.7	$1787.8	$1717.2	$5436.7

eligible purchaser under certain conditions. One condition is when the exporter himself extends credit and financing. A second is when the exporter extends credit based on financing he himself has obtained. A third circumstance would be when no credit is extended by the exporter but the purchaser himself obtains needed funds through his own loan negotiations.

There is a second category of sales possibly necessitating U. S. Government credit guarantees. This consists of sales concluded by the U. S. itself. In one such case, credit is extended by the Government and refinanced through an eligible lender based on evidence of indebtedness received from the purchaser. Government credit guarantees would also be justified when the sales contract itself calls for payment on a cash or "dependable undertaking basis." In this case the purchaser gets funds to meet payments to the U. S. from an eligible lender, pursuant to a loan or credit agreement between the purchaser and the lender.

In urging American business to exploit fully the sales potential of military exports—a program, by the way, that is strongly endorsed by both the President and the Secretary of Defense—Mr. Kuss admonishes such businesses to be guided by the defense objectives of the program as well as by enlightened self-interest.

"The company that has approached the international market with solely a commercial point of view," he warns, "has fared poorly by comparison with the company that approaches the international market as a member of the defense team."

Future issues of the Defense Industry Bulletin will carry a series of articles on the interfaces of Government and Industry in International Logistics, i.e. the Military Export Market.

TABLE II
EXPENDITURE FORECAST
(IN MILLIONS)

Based on Fiscal Year projections of specific item forecasts and analyses of expenditures, this $10 to $15 billion potential may be found largely as follows:

	FY 62 — 71 Minimum	Forecast Potential
EUROPE	$ 7,000	$10,000
FAR EAST	1,000	1,500
WESTERN HEMISPHERE (Includes Canada)	500	1,000
NEAR EAST, SOUTHEAST ASIA, AFRICA	500	1,000
OTHER COMMERCIAL (Not identifiable by region)	1,000	1,500
	$10,000	$15,000

New Navy Attack Aircraft Named Corsair II

The A-7A light attack aircraft (VAL) has been given the name CORSAIR II. The original CORSAIR was the F-4U, a single engine inverted gull wing, Navy and Marine Corps fighter-bomber used extensively in World War II and Korea.

CORSAIR I

CORSAIR II

The new CORSAIR II, a modified version of the F-8 CRUSADER, will be delivered to the Navy in the fall of 1965 and is expected to reach the fleet in the fall of 1966.

The original CORSAIR was manufactured by Chance-Vought Corp., Dallas, Tex., and the new CORSAIR II is produced by Ling-Temco-Vought, Inc., Dallas, Tex.

"Total Package" Concept Planned for C-5A Program

The Secretary of Defense has approved an Air Force proposal to acquire the C-5A transport aircraft under a new "Total Package" procurement technique.

Under the "Total Package" concept, one contract will be awarded on a competitive basis for development, production and lifetime support of the aircraft—including spare parts and ground support equipment. Assistant Secretary of the Air Force (Installations & Logistics) Robert H. Charles, in briefing the press on the new procurement method, stated, "The concept of total procurement is straightforward. It's simply based on the premise that you can set up the proper competitive atmosphere and define accurately what a system is to do. A suitable contract covering development, production and support can be let which will (1) protect the Government against huge overruns; (2) cause contractors to bid realistically for all phases of the program . . . and (3) . . . use the profit motive as the lever to obtain effective management on the part of the contractor."

The competitors for the airframe contract are Boeing, Douglas and Lockheed. For the engine contract, they are General Electric and Pratt and Whitney. The contract in both cases will be awarded to the competitor whose technical and price proposals are considered to provide the greatest overall value throughout ten years of operation.

The "Total Package" procurement technique represents a significant departure from past practices. It can be used in this case because development and production of the C–5A involve no large steps beyond the present technical knowledge of the aircraft industry, and an estimate of production costs can be made without extensive prior development. The Air Force is able to specify the desired performance with considerable precision, and with a reasonable expectation that it can be achieved. (Notwithstanding the dollar amount and duration of the program, the C–5A is one program on which it is reasonable to obtain competitive production commitments at the outset.)

In previous large programs, only development work has normally been awarded at the outset. Subsequently, the production work had to be awarded to the development contractor, on a non-competitive basis, unless the Government was willing to duplicate, at great cost in money and time, much of the work already performed. Thus, the company which won the development contract was for all practical purposes assured, without making any production commitments, of winning the much larger follow-on contracts, which frequently represent over 75% of the total program.

The formula for arriving at the winning competitor's ultimate profit, while providing a strong incentive for high quality at low cost, will not require the contractor to assume all the risk. There will be a sharing of costs above, and of savings below, the competitively established target cost.

The Government will benefit from the "Total Package" plan by realizing considerably lower overall system costs and better operational performance, through competition. In particular:

- It will require a tightening of design and configuration discipline, both in the specifications on which the competitors will submit proposals and in the work under the contract.
- It will largely eliminate unrealistic "salesmanship," including under-estimates of cost and over-estimates of performance, which is encouraged when bidders are required to make firm commitments on only a small portion of the total sale.
- Being committed to cost and performance figures for production units before detail begins, the contractors will have a strong motive to design for economical production, product reliability and simplicity of maintenance, all of which are strongly influenced by actions taken during the detail design period, and for which there is little inducement in the absence of a production commitment.
- The contractors will obtain supplies and services from the most efficient source, whether in-house or by outside contract and, if by outside contract, through competitive bidding, thus providing opportunities for efficient suppliers, including small businesses and those located in economically distressed areas.

The primary advantage to the aircraft industry is the creation of a competitive framework in which profit swings can be much larger than in non-competitive situations—a framework in which the truly efficient contractor can be adequately rewarded. Another advantage is that the contractor will have more responsibility, thereby permitting some relaxation of Government controls which are necessary when the constraints of competition are absent.

Col. Rankin Heads C–5A SPO

A System Program Office (SPO) for the C–5A heavy logistics transport aircraft has been established at the Air Force System Command's Aeronautical Systems Division at Wright-Patterson AFB, Ohio.

Colonel W. F. Rankin, Jr., is the System Program Director and head of the office. M. C. Chase is assistant director.

Three deputy directors to Colonel Rankin are: B. V. Lowry, for engineering; G. E. Oster for procurement; and P. R. Rudeseal (acting) for Test and Deployment. E. D. Monroe is acting Chief of the Configuration Management Division, and Lt. Colonel J. A. Loudermilk is Chief of the Program Control Division. C. B. Hargis, Jr., is Systems Engineering Director.

The SPO will direct all Air Force activities pertaining to the C–5A system throughout its development and testing phase up to the time it becomes part of the operational fleet.

There are other unique features in the proposed C–5A contract. Two of the most significant are:

- Although the engines will be bought by the Air Force directly from the engine company, which will be responsible for the specified performance of the engine as a separate unit, the aircraft manufacturer will be responsible for the performance of the aircraft as an integrated system, including the engines.
- The original contract will cover development, production and support for 58 operational airplanes. However, the Government may later decide to buy more. To prevent non-competitive procurement at such time, the contract will give the Government an option on additional airplanes at prices which can automatically be determined from the company's actual cost experience on previous C–5A's, in accordance with a formula established in the original competition.

The "Total Package" concept will be applied to other appropriate programs in the future and will greatly increase the amount of Air Force work awarded competitively. This is expected to produce more realistic bidding on performance and on cost, the lowest price for products of the desired quality, and an industry framework in which efficient contractors are rewarded appropriately.

ABOUT PEOPLE

DEPARTMENT OF DEFENSE

John M. Malloy was appointed Dep. Asst. Secretary of Defense (Procurement) to succeed **Graeme C. Bannerman,** who is now Asst. Secretary of the Navy (Installations & Logistics). Mr. Malloy assumed his new duties the first week in April. He is a retired Navy captain and during his service in the Navy held a variety of assignments in the procurement field. Since his retirement from active duty in July 1963 he was employed by North American Aviation, Inc., where he was Asst. Corporate Dir. responsible for assisting in the development of company contracting policies and their implementation.

RAdm. Charles A. Blick, SC, USN, Exec. Dir. of Procurement & Production, Defense Supply Agency (DSA), has been reassigned to succeed **RAdm. Jack J. Appleby** as Commanding Officer, Navy Ship's Store Office, Brooklyn, N. Y. Adm. Blick's successor will be announced at a later date.

In another key DSA personnel change, **RAdm. John W. Bottoms,** SC, USN, presently Force Supply Officer, Staff of Commander Service Force, Pacific Fleet, was named to succeed **Maj. Gen. Bruce E. Kendall, USA,** as Exec. Dir., Logistics Services, DSA. Gen. Kendall will become Exec. Dir. of Supply Operations at DSA headquarters.

Other new DSA assignments include: **Col. F. J. Henggeler, USAF,** currently Dir. of Planning & Management, at the Defense General Supply Center, Richmond, Va., will become Dep. Commander of the Center. He will succeed **Col. Charles A. Shaunesey, Jr., USA,** who is being reassigned to Department of the Army headquarters in June; and **Col. William Paule, USAF,** currently Asst. Exec., Hq., DSA, will become Commander, DSA Administrative Support Center and Staff Director, Administration, succeeding **Col. O. R. Rumph, USA.** Col Rumph will leave in April for an overseas assignment. **Col. James A. Cogswell, USAF,** has been assigned as Dir., Industrial Security, Defense Contract Administration Services.

Dr. Edward I. Salkovitz was appointed Dir. for Materials Sciences in the Advanced Research Projects Agency (ARPA) succeeding Charles F. Yost. In this position, Dr. Salkovitz will be responsible for the direction of a broad program of materials research conducted for ARPA by various university and industrial contractors. This research is generally in the field of Solid State Physics, Metallurgy, Chemistry and Structural Mechanics.

New assignments in the Defense Communication Agency are: **Col. John M. Johannes, USAF,** as Asst. for Command, Control & Communications Program Reviews; **Col. Dwane R. Valentine, USAF,** as Dep. Asst. Dir. of Operations.

Col. Carl E. Walker, USMC, has assumed duties as Chief, National Organizations Div., Directorate for Community Relations, Office of Asst. Secretary of Defense (Public Affairs), replacing **Col. Robert A. Carr, USA.**

ARMY

Stanley Rogers Resor has been nominated as Under Secretary of the Army. Prior to this appointment, Mr. Resor was a partner in the New York City law firm of Debevoise, Plimpton, Lyons & Gates, where he specialized in corporate law.

Lt. Gen. Harvey H. Fischer, Commanding General, III Corps, has been named Dep. Commanding General, U.S. Continental Army Command, to succeed the late **Lt. Gen. Edwin J. Messinger, Jr. Maj. Gen. Ralph E. Haines, Jr.,** has been nominated for promotion to rank of lieutenant general and will become Commanding General, III Corps.

Lt. Gen. W. K. Wilson, Jr., Chief of Engineers, will retire on July 1. **Maj. Gen. William F. Cassidy,** now Commanding General of the U.S. Army Engineering Center and Commandant of the U.S. Army Engineer School, has been designated to succeed Gen. Wilson as Chief of Engineers and nominated for promotion to lieutenant general.

Col. Harry W. Elkins is the new Commanding Officer of the U.S. Army Electronics Research & Development Activity, Ft. Huachuca, Ariz.

The new Commanding Officer of Dugway (Utah) Proving Grounds is **Col. William W. Stone,** previously assigned to the Special Projects Office, Joint Chiefs of Staff.

Col. Glenn H. Gardner has been assigned the Commanding Officer, Special Warfare & Civil Affairs Group, U.S. Army Combat Developments Command, replacing **Col. Richard J. Darnell.**

Lt. Col. Howard H. Cooksey has been appointed Chief, Combat Materiel Div., Directorate of Developments, Office of Chief of Research & Development.

New Army Project Manager assignments: At Hq., Army Materiel Command, Washington, D.C.—**William N. Yehle,** Project Manager Staff Officer, XM–561 (Gamma Goat); and **Alan Morningstar,** Project Manager Staff Officer, Generators. At U.S. Army Missile Command, Redstone Arsenal, Ala.—**Robert Whitley,** Dep. Project Manager, TOW weapon system; and **Earl R. Edmondson,** Dep. Project Manager, Shillelagh weapon system.

NAVY

Adm. Thomas H. Moorer will become Commander-in-Chief, Allied Naval Forces in the Atlantic, on May 1. He succeeds **Adm. Harold P. Smith,** who is retiring.

VAdm. Roy L. Johnson, nominated for promotion to admiral, will succeed Adm. Moorer as Commander-in-Chief of the U.S. Pacific Fleet. **RAdm. Paul P. Blackburn,** now Senior Member of the U.S. Armistice Commission in Korea, will succeed VAdm. Johnson as Commander of the Seventh Fleet. Adm. Blackburn was nominated for promotion to vice admiral while holding that post.

RAdm. Levering Smith, Technical Dir. of the Navy's Special Projects Office, has relieved **RAdm. Ignatius J. Galantin** as Dir. of the Special Projects Office. Adm. Galantin has succeeded VAdm. Schoech as Chief of Naval Material.

VAdm. John B. Colwell, Commander, Amphibious Force, Pacific Fleet, has been assigned to the position of Dep. Chief of Naval Operations (Fleet Operations & Readiness) as relief for **VAdm. Alfred G. Ward.** Adm. Ward was appointed U.S. Representative on the Military Committee and Standing Group of NATO.

RAdm. Charles S. Minter, Jr., presently Supt., U.S. Naval Academy, will become Dep. Asst. Chief of Staff for Plans & Policy, SHAPE, early this summer. **RAdm. Draper L. Kauffman,** now the Navy's Dir. of the Office of Program Appraisal, will become U.S. Naval Academy Supt. about the middle of June.

The following U.S. Marine Corps general officer reassignments to be made in May and June have been announced: **Maj. Gen. John H. Masters,** Asst. Quartermaster General will become Commanding General, Marine Corps Supply Center, Barstow, Calif. **Brig. Gen. Melvin D. Henderson,** now Asst. Chief of Staff, G–4, Hq., Marine Corps, will become Commanding General, First Marine Brigade, replacing **Brig. Gen. Marion E. Carl.** Brig Gen. Carl will be ordered to duty as Asst. Wing Commander, First Marine Aircraft Wing. **Brig. Gen. Lewis W. Walt** (selected for major general), present Dir. of the Marine Corps Landing Force Development Center, Quantico, will become Commanding General, Third Marine Div. He will replace **Maj. Gen. William R. Collins,** who will be ordered to Hq., Marine Corps.

Capt. Jack L. Appleby, SC, presently serving in the Navy Ship's Store Office, Brooklyn, N.Y., has been promoted to rank of rear admiral and assigned as Dep. Chief of Naval Material for Material & Facilities.

The following are recent Supply Corps officers assignments: **LCdr. D. Davidson, Jr.,** SC, as Contract Administration Branch Officer, Aviation Supply Office, Philadelphia, Pa.; **Cdr. G. G. Dunn,** SC, as Head, Small Business Div., Office of Naval Material.

AIR FORCE

Gen. Dean C. Strother, formerly U.S. Representative to the Military Committee and Standing Group of NATO, assumed duty as Commander-in-Chief, North American Air Defense Command, and Commander-in-Chief, Continental Air Defense Command, on April 1.

Lt. Gen. James Ferguson, Dep. Chief of Staff, Research & Development, Hq., USAF, has been assigned additional duty as Senior Air Force Member, Military Staff Committee, United Nations.

Maj. Gen. Benjamin O. Davis, Jr., was reassigned from duty as Dir., Manpower & Organizations, Hq., USAF, to Asst. Dep. Chief of Staff, Programs & Requirements, USAF, effective Feb. 19.

Maj. Gen. Elvin S. Ligon, presently Chief of Staff, Allied Air Forces Southern Europe, will become Asst. to the Commander-in-Chief, Pacific Air Forces, on May 1.

Maj. Gen. W. T. Hudnell, Commander, San Antonio Air Materiel Area, will retire from active military duty on June 1.

The following new assignments have been made to positions in Hq., USAF: **Col. Bryan M. Shotts**, Dep. Chief, Strategic Div., Directorate of Operations; **Col. Harold E. Collins**, Aircraft Systems Development Officer, Directorate of Development; **Col. William W. Gilbert**, Chief, Defense Supply Systems Development, Strategic/Defense Div., Directorate of Development Plans; **Col. John C. Newman**, Chief, Projects Div., Directorate of Foreign Development; and **Col. Robert L. Ramsey**, Chief, Military Assistance Sales Branch, Office of Assistant for Mutual Security.

The following are new assignments within the Air Force Systems Command: **Col. James L. Dick**, Vice Commander, Air Force Cambridge Research Laboratories; **Col. Kemper W. Baker**, Dir., Advanced Systems Studies & Analysis, Systems Engineering Group (Research & Technology Div.); **Col. Kenneth B. Fess**, Asst. Dir. of Systems Plans, Electronic Systems Div.; **Col. Joseph Green**, AGMX–1 Project Officer, Aeronautical Systems Div.; **Col. James E. Miller**, Dep. Dir. for Engineering, C–141 System Project Office, Aeronautical Systems Div.; **Col. Harry E. Walmer**, System Program Dir., 416L, Electronic Systems Div.; **Col. Robert L. Elwell**, Chief, Development Div., Air Force Weapons Laboratory; **Col. Andrew Boreski, Jr.**, Dep. for Range Engineering, Air Force Eastern Test Range; **Col. William H. Campbell**, Dep. for Materiel, Air Force Eastern Test Range; **Col. C. N. Chamberlain, Jr.**, Asst. Dir., Systems Engineering, Research & Technology Div.; **Col. Thomas Q. Jones, Jr.**, Chief, Production Management Div., Hq., AFSC; and **Col. M. J. Wetzel**, Dep. Commander, Rome Air Development Center.

Top 100 Defense Contractors FY 1964

The 100 companies listed below and their subsidiaries which received the largest dollar volume of military prime contracts of $10,000 or more in fiscal year 1964 accounted for 73.4% of the United States total. This is a decrease of 0.5 percentage points from the 73.9% during fiscal year 1963. The 73.4% of prime contracts awarded to the top 100 corporate groups during fiscal year 1964 was somewhat lower than the average over the last seven years. The first 10 companies had 1.7% more of the total than in fiscal year 1963, while the remaining companies had an overall decrease of 2.2%. It should be noted that about one-half of the military work of the large concerns is subcontracted with approximately 40% of the amount subcontracted going to small business concerns.

1. Lockheed Aircraft Corp.
2. Boeing Co.
3. McDonnell Aircraft Corp.
4. North American Aviation, Inc.
5. General Dynamics Corp.
6. General Electric Co.
7. American Telephone & Telegraph Co.
8. United Aircraft Corp.
9. Martin-Marietta Corp.
10. Newport News Shipbuilding & Dry Dock Co.
11. Grumman Aircraft Engineering Corp.
12. Sperry Rand Corp.
13. General Tire & Rubber Co.
14. International Business Machines Corp.
15. Hughes Aircraft Co.
16. AVCO Corp.
17. Bendix Corp.
18. International Telephone & Telegraph Corp.
19. General Motors Corp.
20. Thiokol Chemical Corp.
21. Raytheon Co.
22. Ling-Temco-Vought, Inc.
23. Westinghouse Electric Corp.
24. Radio Corp. of America
25. General Telephone & Electronics Corp.
26. Textron, Inc.
27. Ford Motor Co.
28. Litton Industries, Inc.
29. Douglas Aircraft Co., Inc.
30. Chrysler Corp.
31. Northrop Corp.
32. Pan American World Airways, Inc.
33. Standard Oil Co. (New Jersey)
34. Kaiser Industries Corp.
35. F M C Corp.
36. Hercules Powder Co.
37. Collins Radio Co.
38. General Precision Equipment Corp.
39. Standard Oil Company (California)
40. Morrison-Knudsen Co., Inc; Utah Construction Co.; Perini Corp., & C. H. Lervell Co.
41. Honeywell, Inc.
42. Texaco, Inc.
43. Massachusetts Institute of Technology
44. Socony Mobile Oil Co.
45. Aerospace Corp.
46. Thompson-Ramo-Wooldridge, Inc.
47. Continental Motors Corp.
48. Magnavox Co.
49. du Pont (E.I.) de Nemours & Co.
50. Goodyear Tire & Rubber Co.
51. Republic Aviation Corp.
52. Olin Mathieson Chemical Corp.
53. Burroughs Corp.
54. Morrison-Knudsen Co., Inc.; Perini Corp.; & Hardeman (Paul), Inc.
55. Western Union Telegraph Co.
56. Lear-Siegler, Inc.
57. International Harvester Co.
58. Johns Hopkins University
59. System Development Corp.
60. Curtiss-Wright Corp.
61. American Machine & Foundry Co.
62. Day & Zimmerman, Inc.
63. Signal Oil and Gas Co.
64. Asiatic Petroleum Corp.
65. Sverdrup & Parcel, Inc.
66. Cutler-Hammer, Inc.
67. Shell Caribbean Petroleum Co.
68. Kaman Aircraft Corp.
69. Atlantic Research Corp.
70. Eastman Kodak Co.
71. Control Data Corp.
72. Continental Oil Co.
73. Hayes International Corp.
74. Hardeman (Paul), Inc.; Concrete Industries (Monier), Ltd.; & Hutcherson Bros. Pty. Ltd.
75. Cities Service Co.
76. Hazeltine Corp.
77. Mitre Corp.
78. Westinghouse Air Brake Co.
79. United States Steel Corp.
80. Texas Instruments, Inc.
81. Vitro Corp. of America
82. Richfield Oil Corp.
83. Standard Oil Co. (Indiana)
84. Union Oil Co. of California
85. Bethlehem Steel Corp.
86. Electronic Communications, Inc.
87. American Bosch Arma Corp.
88. American Ship Building Co.
89. Firestone Tire & Rubber Co.
90. Gyrodyne Co. of America, Inc.
91. Stanford Research Institute
92. Hardeman (Paul), Inc. & Morrison-Knudsen Co., Inc.
93. Fairchild-Hiller Corp.
94. Sinclair Oil Corp.
95. Kiewit (Peter) Sons' Co.
96. Ryan Aeronautical Co.
97. Dynalectron Corp.
98. Sanders Associates, Inc.
99. Universal American Corp.
100. Leavell, C. H., Co. & Kiewit (Peter) Sons' Co.

MEETINGS AND SYMPOSIA

MAY 1965

Underwater Technology Symposium, May 5–7, at Mohican Hotel, New London, Conn. Sponsor: American Society of Mechanical Engineers, 345 E. 47th St., New York, N.Y. 10017. Presentations will include: Deep Ocean Vehicles—their design, fabrication and operation; Deep Ocean Machinery—the propulsion for deep diving submersibles; underwater manipulators and controls; environment and engineering problems of physiology; and underwater communications and navigation.

National Forum on the Control of Water Quality, May 12–13, at headquarters of American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, Pa. 19103. The purpose of the forum is to bring together eminent authorities to discuss the problems of the control of water quality in industry, commerce, power, agriculture; and for municipal, navigational, fishing, recreational, and other purposes. Attendance by preregistration only. Write to ASTM headquarters for registration information.

JUNE 1965

New aerospace materials that withstand searing temperatures of reentry will be discussed at the **Fourth Materials Symposium,** June 9–11, to be held at the Deauville Hotel, Miami Beach, Fla. Sponsored by the AFSC Research & Technology Division's Air Force Materials Laboratory, Wright-Patterson AFB, Ohio, the symposium is expected to attract more than 1500 Government, university and industry materials engineers. Its purpose is to inform industry of Air Force materials requirements and to determine how industry can best provide them. The symposium will be divided into 26 panel discussions chaired by a Materials Laboratory member and one from industry. Panels will include discussions on manufacturing and metal-working techniques, coatings, composites, high-temperature metals and lubricants, corrosion, nondestructive testing, joining and welding. For additional information contact: Col. Lee R. Standifer, Director, Air Force Materials Laboratory, Wright-Patterson AFB, Ohio.

Symposium on Cost-Effectiveness Techniques, June 14–16, Washington, D.C. Sponsor: Washington Operations Research Council (WORC), c/o Booz, Allen Applied Research, Inc., 4815 Rugby Ave., Bethesda, Md. 20014, telephone: (Area Code 301) 656-2200. Presentations will include: Comprehensive discussion of the measures of cost and effectiveness; analytical techniques, with case studies illustrating application of the techniques; problems and limitations of cost-effectiveness; organization for cost-effectiveness; and research that is needed and discussions of new areas where cost-effectiveness might be applied.

Army Unfunded Studies Program Assistance Outlined

Active assistance and support to industries conducting company-funded studies will be provided by the Army Materiel Command (AMC) as part of a new program which promises to enhance cooperation between the Army and industry.

During the past several years defense industry accomplished many worthwhile studies relating to Army research and development equipment, objectives and requirements. These studies have been a great help to Army R&D and it is to encourage an expansion of this effort that the new program is directed.

Any industrial or research firm may submit at any time a proposal for an unfunded study. The point of contact for all company-funded studies of broad scope is the Technical & Industrial Liaison Office, Office of the Director of Research & Development, U.S. Army Materiel Command, Washington, D.C. Those of narrow scope, falling wholly within the purview of a single AMC subordinate command, research laboratory or project manager may be established and supported by those organizations. Any number of proposals may be submitted; however, each proposal must include the following information:

- Study number.
- Title of study.
- Study description.
- Data indicating the firm has a research and development capability in the area of the proposed study.
- Facility clearance.
- Classification of reports produced.
- Schedule—starting date and date report is to be submitted.
- Study coordinators—Department of the Army and industrial firm (including qualifications and clearances of key personnel concerned with the study).
- Support requested for the study. This should indicate documents and information needed, and individuals or agencies to be visited. As the study progresses, additional information may be desired.
- Conditions:

(1) Signature by an authorized representative of a qualified industrial firm indicates that the firm will pursue the study as described, furnish the AMC agency or command copies of the study and all reports pertaining thereto and obtain authorization to publish any information relating to this study from the sponsoring AMC agency.

(2) Signature by an authorized representative of the Department of the Army indicates approval of the study request.

(3) The qualified industrial firm or the sponsoring AMC agency may terminate the study at any time.

The AMC agency concerned will determine authorization for publication in accordance with Army Regulation 360–27.

Upon receipt of a proposed company-funded study, the Director of Research and Development, AMC, or other appropriate AMC organization, will evaluate the proposal considering the benefits to be derived and the support requested. If the appropriate AMC organization agrees to support the study, active assistance will be provided (consistent with current security regulations) in the form of documents and arrangements for conferences or interviews with key personnel. However, availability of Army personnel for conferences and interviews may, of necessity, be limited due to the pressure of activities connected with management of projects supported by appropriated monies, which have first priority.

After a study has been approved for Army support, the company must execute a policy agreement and return a signed copy to the sponsoring AMC organization. A separate policy agreement must be executed for each approved study.

Approval of a proposed study by the Army includes certification of a company "need to know" for the data

(*Continued on Page* 21)

AMC Regulation Outlines Industry's Use of Army Facilities for Testing

Exercise by the Army Materiel Command (AMC) of its authority to permit the use by private industry of Army facilities for testing iron, steel, and other materials for industrial purpose is described in AMC Regulation No. 70–20, dated November 6, 1964. Delegated by the Secretary of the Army to the Commanding General, AMC, this authority was subsequently redelegated to heads of procuring activities and commanders of installations and activities reporting directly to that headquarters.

The new regulation prescribes the policies, responsibilities, and procedures for planning, conducting and reporting tests and test services for private industry. The provisions of this regulation do not apply to Qualified Products List testing or to military potential testing.

According to this regulation, any individual, private firm, corporation, State government, or other organization which is not a part of the Federal Government (hereafter referred to as "the purchaser") may request tests and test services at an Army installation. In addition, tests and test services for or on behalf of private foreign industry may be performed with the concurrence of the Chief, Mutual Security Office, Headquarters, AMC. Such requests for tests must be made through the foreign government concerned.

Representatives of private industry desiring tests or test services should submit a written request to the Commanding General, AMC or to commander of the appropriate AMC activity or installation. The request must contain information in sufficient detail to allow an estimate of the testing cost and determination of terms and conditions for the test.

The commander concerned will determine whether the testing will be accomplished or test services provided for private industry based upon the following criteria: (1) there must be clear and convincing evidence that the testing requires specialized machines and facilities not found or readily available in private industry, and that competition with private industry is not involved; and (2) the purchaser must agree to execute AMC Form 1271 (Terms and Conditions for Test).

If it is decided that AMC should not conduct the test or provide test services, the purchaser will be advised and reasons for the rejection explained.

If the request is approved, the purchaser will be so advised and also furnished the following information: (1) name of the test agency that will conduct the test or provide the test service; (2) test plan; (3) reporting procedures and requirements; and (4) cost estimates, including an equitable share of direct and indirect overhead costs.

An agreement, in the Terms and Conditions for Test (AMC Form 1271), will be signed by the purchaser and the commander concerned.

Depending upon the nature of the test, the Government may require the purchaser to furnish funding in the amount of the estimated costs to guarantee the purchaser's obligation to hold the Government harmless from claims or loss or damage to property. If costs exceed initially available funds, additional funding must be provided by the purchaser before expenditure by the test facility. Upon completion of the test, any funds in excess of total costs incurred will be returned to the purchaser.

Ordinarily, Government facilities, personnel, or other resources will not be diverted from scheduled tests of Government materiel to perform this service; however, there may be instances in which it would be in the best interest of the Government to revise established test schedules in order to accommodate tests of other than Government materiel. In such instances, priority of the test over those scheduled will be determined by the commander at whose agency the test is to be performed.

Upon conclusion of the test or test services a report of the test will be furnished to the purchaser by the Government in accordance with the reporting procedures and requirements previously established.

Civil Defense Offers Table Display

A new "table-top" display devoted to industrial civil defense is now available for the use of State and local Civil Defense Directors, business firms, and other interested organizations and groups.

Prepared by the Office of Civil Defense, the new full-color display emphasizes the important role of business and industry in the civil defense program and points out how fallout shelters can be provided for employees and the public at industrial and commercial facilities.

The basic theme of the display is summarized on one of the panels, where the standard yellow and black fallout shelter sign is shown and described as "the sign of industrial preparedness and community protection."

The display itself consists of a single strip of heavy art-board, hinged so that when it is set up on a table-top six panels will be visible to the viewer. All panels are about 28 inches high and range in width from five to 17 inches. Industrial civil defense messages, in color, are inscribed on both sides of each panel so that the display may be viewed from either side, or from both sides if a "walk-around" layout is arranged. Set in place, one display occupies a table-top area of about 44 by 12 inches.

Interested organizations may obtain supplies of these displays upon request to the U.S. Army AG Publications Center, Civil Defense Distribution Branch, 2800 Eastern Boulevard, Baltimore, Md., 21220. Packed for mailing, each display measures 18 by 28 inches and comes in a cardboard container for safe transportation and storage.

Dr. Taylor of DASA Wins Memorial Award

Dr. Theodore B. Taylor, Deputy Director, Scientific, of the Defense Atomic Support Agency (DASA), has been named one of the recipients of this year's Ernest Orlando Lawrence Memorial Award for his meritorious contributions to the field of atomic energy. Dr. Taylor, with four other scientists, will be presented the award on April 29 at the National Academy of Sciences in Washington. Each recipient will receive a medal, a citation and $5,000.

Dr. Taylor was cited for "outstanding contributions to the design of nuclear weapons," and also for conceiving the principle of the widely-used TRIGA research reactor.

Dr. Theodore B. Taylor

A leading theoretical physicist, Dr. Taylor was named scientific deputy to Lt. General H. C. Donnelly, USAF, Director, DASA, in 1964. Prior to this appointment, he served at the Los Alamos Scientific Laboratory from 1949 to 1956 and with General Dynamics Corporation's General Atomic Division from 1956 to 1964.

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JUNE 1965

SPEAKERS CALENDAR

OFFICE OF THE SECRETARY OF DEFENSE

Hon. Cyrus R. Vance, Dep. Secretary of Defense, at American Ordnance Assn. Dinner, St. Louis, Mo., April 27.

Maj. Gen. Francis C. Gideon, Dep. Dir., Defense Supply Agency, at DSA-Federal Procurement Days, Berkeley, Calif. April, 28.

Maj. Gen. J. B. Bestic, Dep. Dir. for National Military Command System, Defense Communication Agency, at Telephone Pioneers Assn. Meeting, Washington, D.C., April 29.

Gen. Earle G. Wheeler, Chairman, Joint Chiefs of Staff, Armed Forces Day Address, San Francisco, Calif., May 7.

Hon. Charles J. Hitch, Asst. Secretary of Defense (Comptroller), Armed Forces Day Addresses at Stockton, Calif., May 12; at Torrance, Calif., May 14; at San Fernando, Calif., May 15.

ARMY

Maj. Gen. A. W. Betts, Dep. Chief of Research & Development, at American Institute of Aeronautics & Astronautics Meeting, Purdue University, Lafayette, Ind., April 27; at Sylvania Management Club of Buffalo Meeting, Williamsburg, N.Y., May 13.

Lt. Gen. L. J. Lincoln, Dep. Chief of Staff for Logistics, at Transportation School, Ft. Eustis, Va., April 28.

Lt. Gen. William W. Dick, Jr., Chief of Research & Development, at 1965 National Junior Science & Humanities Symposium, West Point, N.Y., April 29.

Hon. Stephen Ailes, Secretary of the Army, to Graduating Class of the National Inter-departmental Seminar of the Foreign Service Industrial Institute, Washington, D.C., April 30; Armed Forces Day Address, Atlanta, Ga., May 13; Armed Forces Day Address, Chicago, Ill., May 14; at Eleventh Annual National Strategy Seminar, Carlisle Barracks, Pa., June 10.

Gen. Harold K. Johnson, Chief of Staff, Armed Forces Day Address, Hartford, Conn., May 11; at American Defenders of Bataan & Corregidor Banquet, Washington, D.C., May 15 (Appearance only); at Army Relief Society, New York, N.Y., May 18.

Lt. Gen. W. H. S. Wright, Chief, Office of Reserve Components, Armed Forces Day addresses at Hanover, N.H., May 12; at Miami, Fla., May 14 and 15.

Gen. C. W. Abrams, Jr., Vice Chief of Staff, Armed Forces Day address at Columbus, Ohio, May 14.

Maj. Gen. Frederick J. Clarke, Dir. of Military Construction, Office, Chief of Engineers, at Annual Joint Meeting of The Society of American Military Engineers, The Georgia Engineer Society, and The Society of Professional Engineers, Ft. Benning, Ga., May 14.

Lt. Gen. Walter K. Wilson, Jr., Chief of Engineers, at American Society of Civil Engineers Transportation Engineering Conference, Minneapolis, Minn., May 17; at 45th Annual Meeting of Society of American Military Engineers, Ft. Belvoir, Va., May 24.

NAVY

Hon. Paul H. Nitze, Secretary of the Navy, at American Society of Naval Engineers Meeting, Washington, D.C., April 30; Armed Forces Day Address at Houston, Tex., May 13; at Naval Academy Alumni Assn. Meeting, Washington, D.C., May 19.

Brig. Gen. J. O. Butcher, Commanding General, USMC Supply Activity, Philadelphia, Pa., Armed Forces Day addresses at Camden, N.J., May 11; at Reading, Pa., May 15.

RAdm. C. K. Duncan, Commander of Cruiser & Destroyer Force, Atlantic, at Commissioning of JOSEPHUS DANIELS (DLG27), Boston, Mass., May 8.

Adm. David L. McDonald, Chief of Naval Operations, Armed Forces Day address at Tulsa, Okla, May 14; at SHAPEX Conference, Paris, France, June 14.

Gen. Wallace M. Greene, Jr., Commandant, U.S. Marine Corps, Armed Forces Day address at Seattle, Wash., May 14.

Hon. R. W. Morse, Asst. Secretary of the Navy (Research & Development), at Second Symposium on Military Oceanography, Washington, D.C., May 5; at Acoustical Society Meeting, Washington, D.C., June 3.

Hon. K. E. BeLieu, Under Secretary of the Navy, at launching of GUARDFISH (SS(N)612), at Camden, N.J., May 15.

AIR FORCE

Gen. W. H. Blanchard, Vice Chief of Staff, at Air Force Assn. Meeting, Santa Monica, Calif., May 1.

Gen. J. P. McConnell, Chief of Staff, at Press Club, Washington, D.C., May 5; Armed Forces Day address at Pittsburgh, Pa., May 14.

Gen. B. A. Schriever, Commander, Air Force Systems Command, at Aerospace Electronics Conference, Dayton, Ohio, May 11; at Aviation/Space Writers Assn. Meeting, Albuquerque, N.M., May 20.

Maj. Gen. S. J. McKee, Dir. of Plans, at Central Florida Executive Club Meeting, Orlando, Fla., May 11.

Hon. Brockway McMillan, Under Secretary of the Air Force, Armed Forces Day address at Cleveland, Ohio, May 11.

Maj. Gen. D. R. Ostrander, Commander, Office of Aerospace Research, at MIT Luncheon Club Meeting, Washington, D.C., May 12; at Advanced Propulsion Symposium, Palo Alto, Calif., May 26–28.

Hon. E. M. Zuckert, Secretary of the Air Force, Armed Forces Day address at Detroit, Mich., May 12.

Gen. J. D. Ryan, Commander-in-Chief, Strategic Air Command, Armed Forces Day address at Oklahoma City, Okla., May 14.

Lt. Gen. H. B. Thatcher, Commander, Air Defense Command, Armed Forces Day address, Dallas, Tex., May 14.

Maj. Gen. B. I. Funk, Commander, Space Systems Div., AFSC, at Aero Propulsion Laboratory, Minneapolis, Minn., May 25.

Part of Offshore Petroleum Procurement Returned to U.S.

To implement international balance of payments objectives, the DOD will return about nine per cent of its total annual offshore petroleum procurement of 124 million barrels to the United States. These petroleum products, now costing approximately $27 million annually, will be purchased from domestic suppliers. This move will not affect procurement of petroleum from Venezuela.

The program will be carried out by the Defense Fuel Supply Center, Washington, D.C., a field activity of the Defense Supply Agency, buyer of petroleum products for the Armed Forces. The Center will develop plans for determining the specific items to be returned to the United States for procurement.

DOD Report on Small Business Procurement July 1964–January 1965

Small business firms received $2,809 million in prime contract awards during the first seven months of fiscal year 1964 (July 1964—January 1965), which was $331 more than the amount received in the same seven months of the previous fiscal year.

Defense procurement from all U.S. business firms totalled $13,629 million during July 1964—January 1965, which was $1,085 million less than the total for July 1963—January 1964. There were reductions of $1,093 million in missile and space systems, $295 million for other major hard goods, and $128 million for services. These reductions were partially offset by increases of $293 million for procurement of commercial type items, small purchases and construction, and $138 million for civil functions (rivers and harbors work).

As shown in Table I, those categories of procurement which had a reduction in the volume of procurement have a low small business percentage, while those categories having increases in the volume of procurement have a relatively large small business percentage. The net effect of these changes is a substantial increase in the small business percentage to 20.6% during July 1964—January 1965, compared to 16.8% for the same seven months of fiscal year 1964, and 18.0% for the entire fiscal year 1964.

Small business firms participate in the production of missiles and other major hard goods through subcontracts from large business firms to a greater degree than through prime contracts. As noted above, there has been a marked decrease in such procurement from large business firms. The dollar volume of subcontract commitments to small business firms by large business firms has also declined, totalling $2,003 million for July 1964—January 1965, compared to $2,056 million for the same months of the previous fiscal year.

Prime contract awards for experimental, developmental, test and research (EDTR) work are included in Table I, and shown separately in Table II. Small business firms received $73 million in prime contract awards for EDTR work during July 1964—January 1965, compared to $75 million for the same months of the previous fiscal year. Small business firms received 2.9% of EDTR prime contract awards during July 1964—January 1965, compared to 2.3% for the same months of fiscal year 1964, and 3.7% for the entire fiscal year 1964.

TABLE I

SMALL BUSINESS SHARE OF DEFENSE PROCUREMENT

(Amounts in Thousands)

Type of Firm and Category of Procurement	Fiscal Year to Date		Fiscal Year
	1965	1964	1964
	Jul 64–Jan 65	Jul 63–Jan 64	Jul 63–Jun 64
DEFENSE PROCUREMENT (PRIME CONTRACTS) FROM ALL BUSINESS FIRMS	$13,628,886	$14,714,427	$26,920,411
Missile & Space Systems	2,483,544	3,576,862	5,579,354
Other Major Hard Goods	5,777,456	6,073,381	12,087,213
Services	844,603	972,424	1,800,017
Commercial Items, Construction & All Purchases Under $10,000	3,888,456	3,595,363	6,754,479
Civil Functions	634,827	496,397	699,348
DEFENSE PROCUREMENT (PRIME CONTRACTS & SUBCONTRACTS) FROM SMALL BUSINESS FIRMS—TOTAL	4,812,330	4,534,589	8,471,472
PRIME CONTRACTS (SUB-TOTAL)	2,808,865	2,478,430	4,841,951
Missile & Space Systems	33,202	48,703	89,219
Other Major Hard Goods	510,787	382,224	885,064
Services	172,404	265,547	412,196
Commercial Items, Construction & All Purchases Under $10,000	1,841,249	1,566,169	3,132,622
Civil Functions	251,223	215,787	322,850
SUBCONTRACTS	2,003,465	2,056,159	3,629,521
PERCENTAGE OF DEFENSE PROCUREMENT TO SMALL BUSINESS FIRMS—TOTAL	35.3%	30.8%	31.5%
PRIME CONTRACTS (SUB-TOTAL)	20.6%	16.8%	18.0%
Missile & Space Systems	1.3	1.4	1.6
Other Major Hard Goods	8.8	6.3	7.3
Services	20.4	27.3	22.9
Commercial Items, Construction & All Purchases Under $10,000	47.4	43.6	46.4
Civil Functions	39.6	43.5	46.2
SUBCONTRACTS	14.7	14.0	13.5

TABLE II

SMALL BUSINESS SHARE OF MILITARY PROCUREMENT OF EXPERIMENTAL, DEVELOPMENTAL, TEST AND RESEARCH WORK

(Amounts in Thousands)

Type of Firm and Department	Fiscal Year to Date		Fiscal Year
	1965	1964	1964
	Jul 64–Jan 65	Jul 63–Jan 64	Jul 63–Jun 64
TOTAL	$2,499,033	$3,237,344	$5,144,825
Army	572,283	522,563	867,003
Navy	447,132	467,193	893,248
Air Force	1,479,618	2,247,588	3,369,270
Defense Agencies[1]	—	—	15,304
SMALL FIRMS	73,218	74,951	189,704
Army	21,906	17,492	48,182
Navy	25,653	29,279	69,831
Air Force	25,659	28,180	66,078
Defense Agencies[1]	—	—	5,613
OTHER FIRMS	2,425,815	3,162,393	4,955,121
Army	550,377	505,071	818,821
Navy	421,479	437,914	823,417
Air Force	1,453,959	2,219,408	3,303,192
Defense Agencies[1]	—	—	9,691
SMALL FIRMS AS A % OF TOTAL	2.9%	2.3%	3.7%
Army	3.8	3.3	5.6
Navy	5.7	6.3	7.8
Air Force	1.7	1.3	2.0
Defense Agencies[1]	—	—	36.7

[1] Data for Defense Agencies are available only for the full fiscal year.

FROM THE SPEAKERS ROSTRUM

The following are excerpts from address by James W. Roach, Asst. Dir. (Engineering Management), Office of Defense Research & Engineering, at DOD Advanced Planning Briefings for Industry.

Management Trends in Defense Development and Production

* * * * * * * *

I would also like to make it very clear from the outset that the policy and procedural changes I will describe are designed not to provide rigidity or to inhibit judgment but rather to establish a framework within which the widest discretion may be exercised in dealing with each individual transaction. Primarily we are seeking to assure that such discretion is exercised with an excellent understanding of the facts of the individual case and of the Department's overall objectives. Secondarily, we are also seeking to find ways to give wider latitude to the managment judgments of our contractors with the assurance that their motivations are always consistent with our objectives. By this means we expect to reduce Government intervention in corporate management.

Specific Changes in Management Policies.

1. **Categorization of Research and Development.** In order to insure the development and proper management of an adequate technological base for new weapons it was concluded that there was need for a departure from the traditional concept of "research and development" as a single subject. This total field was divided into six categories which, in turn, highlighted the fairly obvious fact that the different categories of work, which had previously been lumped as "R&D," needed quite different management techniques. A description of these categories follows:

a. The *Research* category encompasses effort directed toward increased knowledge of natural phenomena and enviroment; also, effort directed to defining the causes of problems in the engineering sciences and their possible solutions. This work is most frequently done either in Government laboratories or under cost-reimbursement contracts or grants with universities.

b. *Exploratory Development* includes effort directed to specific military problems short of the development of usable hardware. It includes studies to establish the feasibility of new techniques, processes, materials, components, devices, subsystems, and systems which may have military application. It will normally be performed on a cost-plus-fixed-fee or incentive basis.

c. *Advanced Development* adds another dimension to the development. We add the operational and technical suitability demonstration. It is characterized by the development of specific hardware or components for test and evaluation rather than for service use. It would normally be covered by incentive contracts.

d. *Engineering Development* has, as a primary objective, design engineering for service test; for instance, a new avionics system for an aircraft in operational use. Too often, in the past, we have tied each advance in materials or components to a specific weapon system when such an item should be developed for use by many systems. Contracts for engineering development work should be on a fixed price or an incentive basis.

e. *Operational Systems Development* is that effort directed toward development, engineering and test of systems, support programs, vehicles and weapons that have been conditionally approved for production and deployment. Contracts for systems development should be on a fixed price or an incentive basis. This work may not be done under cost-plus-fixed-fee contracts. . . .

Now, what does this resume of our R&D categories mean to industry? Obviously, a great deal, if you are in the R&D field. It should furnish you clues as to the amount of technical risk and advancement you should undertake by contract as well as the types of R&D effort you should seek, depending on the status of the concept you want to pursue.

2. **Statements of Military Requirements.** In the very early phases of the evolution of new weapons it is usually desirable to state the requirement in terms of the mission to be accomplished or job to be done, e.g., transport troops, destroy certain types of targets, or the like. . . . By stating our needs in this manner, we hope to encourage innovation and the exploration of untried technical approaches. However, as we progress to the end of the spectrum represented by Engineering or Operational Systems Development we will progressively have selected our approach, determined its feasibility and become prepared to describe the performance we want in specific terms such as X miles or range, Y margin of accuracy, Z tons of payload, as well as acceptable ranges of cost and time of deployment. Thus our management methods assist us in making it clearer to you, at each successive stage, exactly what our requirements are.

3. **Project Definition.** In order to minimize large outlays of funds against concepts which may not be feasible, we are now following the practice of inaugurating large systems development projects only after completion of what we call a "Project Definition Phase." This phase, which is intended as a screen through which all major systems developments shall pass, is the process by which we, together with our contractors, do our thinking and planning on new major weapons. PDP comes after a conditional decision has been made to acquire the weapon or systems.

Very briefly, the project definition phase, which is funded by the Government, begins with the solicitation of proposals from qualified industrial firms. Its purpose is simply to define the program and establish the feasibility of its performance, time and cost prior to authorizing full-scale development. At the beginning of PDP we do not normally attempt to establish rigorous specifications, preferring to encourage initiative and innovation on the part of competing contractors and contractor teams. We will frequently support and fund more than one approach throughout the whole project definition period.

The competing contractors can explore in depth the

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many unknowns which are present in any new effort. They can determine in outline the overall design and define the subsystems and major components. Most important, they can identify the critical problems and make good estimates of how long and how much money it will take to solve them.

With this information at hand, the Government is in a much better position to decide whether to proceed with full-scale development or concentrate on advancing requisite technology. If the answer is to proceed, we will be able to negotiate the development contract (and occasionally the subsequent production contract), in a competitive climate, with one of the teams which has already been established with a visible history of successful collaboration during the project definition phase. . . .

4. Pert/Cost. . . . This management system, used during project definition, permits an initial detailed analysis and evaluation of forecasts of the cost and time required to complete each step in a major development and, thereafter, provides a basis for very early identification of potential schedule slippages or cost overruns so that corrective actions can be taken promptly. It is an intricate system and, hence, extensive training programs in its use have been developed for both Government and industry personnel.

5. **Project Management.** On most of our major weapons systems we have assigned to one person the personnel, the funds and the authority to manage the system throughout its development and production phases. It is felt that the use of such project managers provides faster decisions to industry and more reasoned trade-offs when opposing considerations of time, performance or money must be faced. A policy on the use of project management in our major systems is expected to be approved within the next few weeks.

6. **Changes in Contract Types.** In 1962 the Armed Services Procurement Regulation was modified to emphasize the selection of contract types which provide maximum profit incentive for superior performance. These contract types stated in order of preference are firm fixed price, fixed price incentive, cost-plus-incentive-fee and, last, cost-plus-fixed-fee. . . .

a. *CPFF Contracts.* The use of CPFF contracts within the DOD reached a high point in the first nine months of FY 1961 when our studies revealed that 38% of our procurement dollars ($8.4 billion annually) were in this form of contract.

Since that time our use of CPFF contracts has been drastically reduced to the point where they now represent only a little over 10% of our procurement dollars. . . .

b. *Fixed Price Contracts.* ASPR has always stated a clear preference for firm fixed price contracts. It is evident from our studies of pricing trends that, in the past, we and our contractors have been somewhat timid about going to such contracts. There is also evidence that this reluctance is being overcome. As a percentage of our total procurement, firm fixed price contracts rose from 31.5% in FY 1961 to 38.0% in FY 1962 to 41.5% in FY 1963 and to 46.3% in FY 1964. This trend is being encouraged. . . .

c. *Incentive Contracts—General.* Following the firm fixed price contract, the next preference stated in ASPR is for fixed-price incentive and cost-plus-incentive fee contracts in that order. . . . The major advantage of incentive contracts is that profit is dependent upon how well the contractor performs. . . .

Incentive contracts in a sense are contrived substitutes for the normal disciplines imposed in the market place. The concept of incentive contracting is not new. Only the current emphasis as a means of getting away from CPFF contracting is new. . . .

7. **Increased Competition.** At this point I would like to discuss briefly our efforts to increase *price competition.* It is one of our major procurement objectives to make more logical and timely decisions with respect to price competition. This subject is under constant scrutiny. We have found that only through very careful advanced planning can we assure, on the one hand, that we have all the data, test results and procurement lead time to permit competitive buying where this is logical and, on the other hand, that we can make early identification of those cases where, for technical, economic or other reasons, it would be ill-advised to seek competition. We find the better our advanced planning, the sharper and more assured our decisions become. This, in turn, usually results in more and better competitive procurement with greater demonstrable savings. . . .

The increased level of price competition which we have achieved has been made possible by such actions as the following:

a. Setting quotas for the improvement to be achieved by each major buying office and reporting the progress made monthly by both commodity program and by purchasing organization.

b. Requiring procurement planning several years in advance for every major non-competitive item, determining the method of procurement which will be followed throughout the life of each such items and the date when data and drawings will be available for full competitive procurement.

c. The establishment of a detailed decision-making process to identify items which can, and those which cannot, be safely and economically procured on a competitive basis.

d. Searching out potential areas for the greater use of Two-Step Formal Advertising and Multi-Year buying procedures, where our savings have been quite spectacular. . . .

8. **Contractor Performance Evaluation.** This program, which was established in August 1963, is designed to provide an orderly and uniform method of determining the effectiveness of major defense contractors in meeting their contractual commitments under contracts for engineering development and operational systems development. . . . This program is designed to replace the individual and varying subjective judgments as to past performance that have been relied on in the past, both in new source selection and in profit negotiations. The success of this evaluation program depends on having sound and measurable contractual commitments. Hence, the performance evaluation program both depends on and supports the other management improvements I have been describing.

An application of this CPE principle to production contracts has been designed and is now undergoing field tests.

9. **Profit Guidelines.** About two years ago we published a set of weighted guidelines for profit to be used by our contracting officers when they negotiate contracts based on analyses of estimated costs of performance. It was our intention, through the use of these guidelines, to draw very substantial distinctions in profit allowances between contractors who do and those who do not undertake significant contract cost risks, between those who do and those who do not provide their own facilities and working capital, and between those who have a good and those who have a poor record of past performance.

Other Management Improvements.

Up to this point I have endeavored to highlight some of the major improvements within the DOD which have been directed towards the process of weapons development and accquisition. I would like to mention briefly, however, a few other actions we have taken to improve our management.

1. **Value Engineering.** A substantial effort is being directed toward improving our value engineering programs under which the Government provides substantial incentives to its contractors to encourage them to engineer ways to reduce the costs of our hardware without any degradation of its function. A new section on this subject was added to ASPR in November 1963. It has been modified once and further changes to make the incentives more effective are likely in the near future.

2. **Technical Data.** We have recently revised our policies with respect to the rights which we will acquire in technical or design data originated by our contractors. This revision was designed to give more protection to the private innovator while assuring to the Government requisite rights in data developed at its expense.

3. **Training and Career Progression.** As a result of the increasing management complexity introduced by the techniques I have been describing, we have found it necessary to increase and improve our training program. In the four years ending in June 1965, more than 23,000 procurement and technical personnel will have completed courses in our tri-service schools.

4. **Organizational Realignments.** Secretary McNamara has directed realignment or unification of several establishments in the interest of improving the management of our procurement processes. These include the creation of the Defense Supply Agency, the Defense Contract Administration Services Activity and, more recently, the Defense Contract Audit Agency.

5. **Procurement Management Review.** We have long been concerned with the manner in which some of our new policies and procedures are being administered in actual operation. Accordingly, we have developed an organization with the capability of examining in depth the actual results of these new management shifts at our major procurement installations. These periodic reviews are normally comprehensive in nature. . . .

Effect on Subcontractors.

At first glance it may appear that these management changes apply only to the large systems contractor. This is not the case. By design, the changes I have broadly outlined include provision for protecting or expanding the role of the subcontractor in military procurement. They also provide for the protection of the rights of the private innovator at any level of contractor.

Our improved procurement planning, including Program Definition, sharply reduces the possibility of termination of major programs in midstream which frequently causes major subcontractor hardship. This planning will also permit more orderly breakout to competition of components and subsystems within the capability of the smaller contractor.

Use of contract types which place increasing price risk on the contractor should lead to more sound make or buy decisions based on quality and economy rather than prime plant loading and volume considerations. The Profit Guidelines specifically provide for reward or penalty to the prime contractor based on the quality of his small business subcontracting program. Current contract provisions for Value Engineering authorize the flow-down of incentive payments to subcontractors.

In short, the first impact of DOD procurement management changes is on the major systems contractor but, because of the requirement for quality performance at reduced cost in a competitive atmosphere, benefits will flow to all echelons of defense industry.

Future Changes.

From all of the foregoing it may be observed that the rate of change in defense policies on weapons development and acquisitions accelerated tremendously in the last four years. Change is inevitable in our business and further change is to be anticipated. In this context there are several efforts soon coming to fruition which can be expected to be of interest to both DOD personnel and the defense industry.

One of these is a procedure which will allow us to measure the extent to which the current workload of a contractor has moved away from CPFF or other low risk contracts to fixed price or higher risk contracts so that a higher percentage of every dollar he spends in overhead comes out of his own pocket. As this percentage gets higher, he has a greater stake in assuring prudent management. Clearly there should be some cross-over point where we can discontinue some of the government controls which were imposed during the period of heavy CPFF contracting, and perhaps also relax the scope and depth of our auditing. We are currently developing standards and procedures for measuring such increases in the contractor's share in his overhead expenditures. Our efforts are being fully coordinated with interested industry groups.

We also have under consideration a proposed new directive on selection of sources for major new developments. The objectives are to increase the latitude of the selection authority, to enroll the efforts of the appropriate management level in the selection activity, and to improve source evaluation techniques so that greater objectivity can be brought to bear. While the pending DOD Draft Directive applies only to major systems, the principles cited are equally applicable to all evaluation and selection actions. Coordination is continuing with industry.

Conclusion.

I hope I have made it clear that the management improvements that we have noted here today, while very significant and mutually interrelated and reinforcing, will not prove to be the final word. In the next four years we will continue to study many new areas to initiate improvements where necessary while at the same time we will strive to consolidate the progress already achieved. In these efforts we will continue to stress greater opportunities for risk and reward to our defense contractors and, we hope, a progressive lessening of Government controls on company managements. We solicit the cooperation and assistance of industry in achieving these ends.

Maj. Gen. Lane Commander of Newly Activated MTMTS

The Military Traffic Management and Terminal Service (MTMTS) was formally activated on February 15 as a major field command of the Department of the Army. In a special ceremony at the Pentagon Honorable Stephen Ailes, Secretary of the Army, presented Major General John J. Lane, USA, general orders activating MTMTS. General Lane also received special orders naming him Commander of MTMTS and Executive Director for Military Traffic, Land Transportation, and Common-User Ocean Terminals.

MTMTS is an amalgamation of the Defense Traffic Management Service (DTMS), the Army Terminal Commands, the Army and Navy common-user ocean terminals, the Air Traffic Coordinating Officers of the Army, Navy, and Air Force, and other key traffic management functions previously performed by the Military Services. Its operational mission is to manage the utilization of commercial transportation for military cargo and personnel in the continental United States and to operate and manage all military ocean terminals except those used by the Navy in support of the fleet. In addition to a National Headquarters in Washington, D. C., MTMTS has three Area Commands.

As the MTMTS Commander, General Lane is designated Executive Director of traffic management functions for Secretary of the Army, who is the Single Manager for Military Traffic, Land Transportation, and Common-User Ocean Terminals. With more than 30 years of distinguished military service, General Lane has outstanding qualifications for his assignment. Among the positions of high responsibility he has held in military transportation and traffic management are the following: Commander, U. S. Army Transportation Center, Ft. Eustis, Va.; Director of Logistics Manpower & Doctrine for the Office of the Deputy Chief of Staff for Logistics; and Assistant Chief of Transportation (Military Operations), Department of the Army.

The MTMTS organization is jointly staffed to perform its mission to execute all assigned traffic management functions and common-user terminal service activities for the DOD.

Disposal of Excesses in National Stockpile Approved by OEP

As a result of a recent requirement computation, maximum stockpile objectives for many strategic and critical materials contained in the National Stockpile have been substantially reduced by the Office of Emergency Planning (OEP). This has resulted in many materials becoming excess. Approval for the disposal of a number of these materials has been granted. Others are expected to follow.

A list of the materials contained in the National Stockpile, indicating those in which excess has been approved for disposal, is given below. Any defense contractors having a problem in obtaining delivery of appreciable quantities of the materials listed should contact their contracting officers for possible relief or assistance in utilizing these excesses.

DOD has cooperated to the fullest extent in the utilization of stockpile excesses. Some of these uses: feathers and down in sleeping bags and medical pillows; quebracho in tanning leather for military footwear; mercury in dentistry; and cadmium in plating. These actions by DOD have resulted in cost savings of millions of dollars.

There is nothing basically new about stockpiling—history is replete with examples of storing materials during times of plenty and tranquility for use in times of scarcity or turmoil. During World War II, this nation found itself in short supply of many materials and dependent upon foreign nations for many of its needs. In many cases delivery was cut off by the enemy, causing serious difficulty. To minimize anticipated problems the National Stockpile was established by the Strategic and Critical Materials Stockpiling Act of 1946. Its purpose is to insure the availability for a reserve of such materials. Currently there are approximately 100 different kinds and grades of materials contained in the stockpile. The acquisition cost of these materials is approximately $8.5 billion.

OEP is charged with the responsibility of selecting and determining whether a material is considered critical or strategic. To do this, the Military Departments, Defense Supply Agency and other interested agencies are called upon to furnish their estimated requirements for the selected materials covering full mobilization based on the latest war plans. Using the total estimated mobilization requirements versus availability in the Continental United States and from friendly foreign nations during an emergency, OEP establishes stockpile objectives. After the establishment of kinds and quantity of materials to be stockpiled by OEP, the General Services Administration (GSA) is charged with the full responsibility of procuring, storing, rotating, disposing and record keeping.

Periodically, as logistic guidance is changed and the U. S. economy grows, recomputations of requirements are called for which often alter the objectives. In the event the objectives are decreased below the levels on hand in the stockpile, OEP declares the differences as excess. A study is then made by the OEP to determine whether these excesses can be disposed of without injury to the national economy. If the study reveals that the materials can be disposed of with little effect on industry and the economy, GSA prepares a disposal plan, (quantity to be disposed, rate and procedures for disposal), coordinates with the interested Federal agencies and industry and submits to OEP for approval. After OEP approval, GSA submits disposal legislation to Congress for its approval. The law requires a six months waiting period, after publishing disposal action in the Federal Register, before any action can be taken to effect the physical disposal; however, in cases of urgency, Congress may waive this requirement.

*Aluminum
*Antimony
*Asbestos
Bauxite
Beryl
Beryllium Metal
Bismuth
*Cadmium
Caster Oil
Celestite
Chromite
Cobalt
Coconut Oil
Colemanite
Columbium
*Copper
*Cordage Fibers
Corundum
Cryolite
*Diamond Dies
Diamond, Industrial Crushing Bort
Diamond, Industrial Stones
Diamond Tools
*Feathers and Down
Fluorspar
Graphite
Hyoscine
Iodine
*Mercury
*Mica
*Molybdenum
*Nickel
Opium
Palladium
Palm Oil
Platinum
Pyrethrum
Quartz Crystals
Quinidine
Quinine
Rare Earth
Rhodium
*Rubber
Ruthenium
Rutile
Sapphire & Ruby
Selenium
Shellac
Silicon Carbide, Crude
Silk Noils and Waste
Silk Raw
Sperm Oil
Talc, Steatite
*Tantalum
Thorium
Tin
Titanium Sponge
Tungsten

* Excesses have been approved for disposal.

U.S./Italian Agreement on M-60 Tank Production

The Department of Defense and the Italian Ministry of Defense have concluded an agreement for a joint production of M–60 medium tanks in Italy. Under this agreement, the first tanks (approximately 20 per cent of the envisioned total) will be furnished by the U. S. directly from production, thereby accelerating delivery of the new vehicles to the Italian Army. The remaining tanks will all be built by cooperative production at Italian plants under technical arrangements being developed by the U. S. prime manufacturer, the Chrysler Corp., and Italian manufacturers.

Collaboration between the U. S. and Italy in the field of military production has been in existence for several years.

Specifically, M–113 armored personnel carriers are now being produced in Italy in Italian-U. S. cooperative production. Close cooperation also exists between the two countries in the field of research and development with exchange of technical data on specific projects and production of scientific material of common interest.

The recent agreement regarding the M–60 tanks is particularly welcomed by the U. S., not only because it means considerable contribution to the modernization of equipment already under way in the Italian Armed Forces committed to NATO, but also because it creates a considerable amount of work for U. S. industry. Of more immediate importance, with the sale of tanks and components produced by the U. S., this co-production project will make a significant contribution toward improving the U. S. balance of payments situation.

Defense Contract Admin. Unified

(*Continued from Page* 2)

establishment of a Contract Administration Advisory Board in the Office of the Secretary of Defense and establishment of a national planning group for contract administration services under the DSA.

At the same time the Philadelphia pilot test was brought to a close, and a pattern for operation nation-wide was drawn out of the information gathered in the pilot test program. Finally, a merger plan was worked out to extend the unified concept of contract administration services nation-wide in 11 regions without disrupting the very essential work on defense contracts.

It is expected that the new national organization will be established early in 1966 and be in a position to present industry with uniform procedures in contract administration services. This will reduce the number of DOD organizations dealing with defense industry on common functions such as inspection and acceptance of material, quality control, accounting for government property, security clearance of contractors' facilities and personnel to handle classified information and payments of contractors. CAS will be jointly staffed with military and civilian representatives from all military services and DSA.

The improved service so far worked out at Philadelphia indicates that the new organization can achieve savings of personnel with better service to the contractor. Since the various specialists will be essentially the same people, the quality will be at least as good as before and, because of new unified procedures and policies, should improve.

Experience indicates that full cooperation of the contractors is essential to make this new organization work. The Philadelphia experience points out that the new regulations will not in themselves provide a better service unless contractors give their complete support.

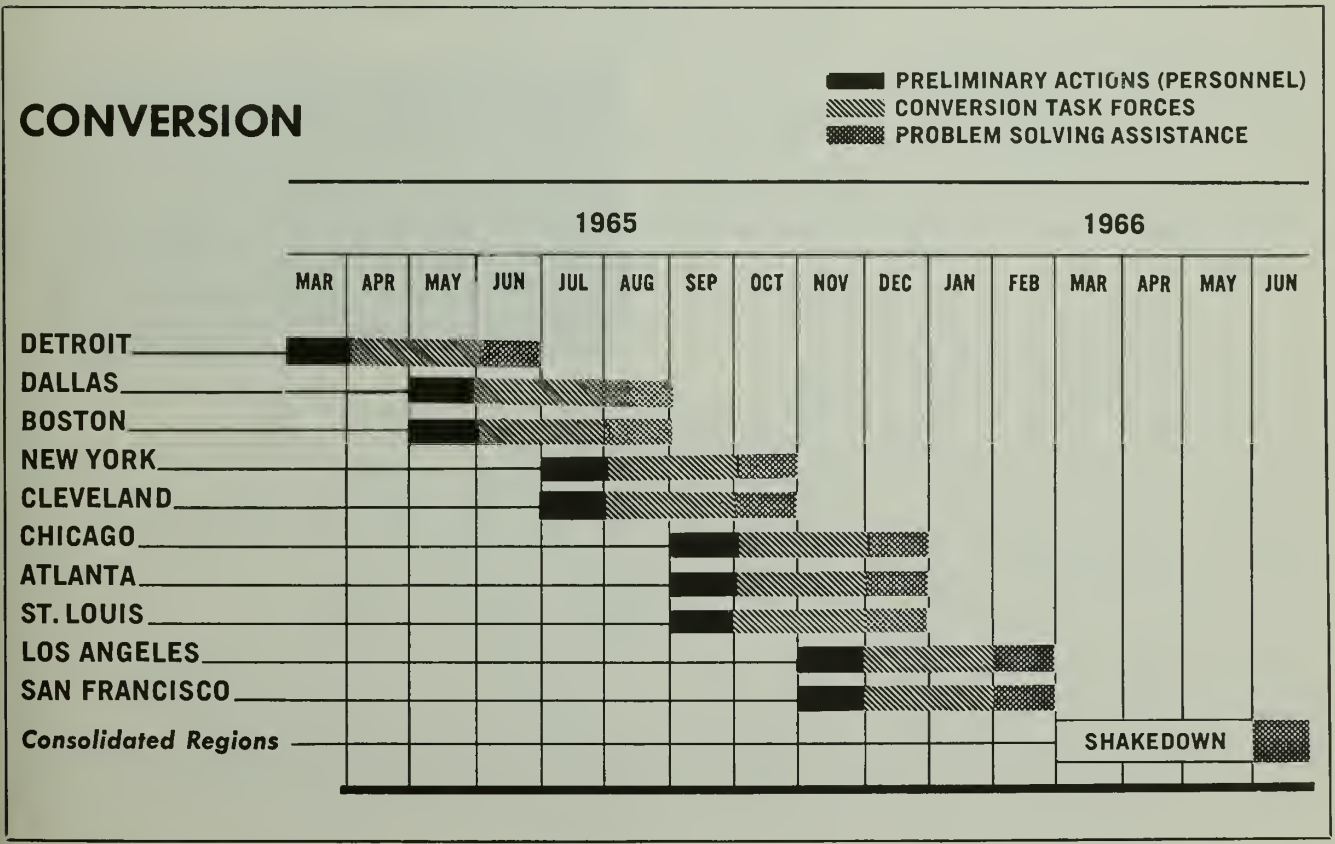
A good example of the need for a special effort on the part of contractors is the following experience in Philadelphia. There were problems with payments to contractors. A backlog of overdue payments developed for a number of reasons mostly arising from misunderstandings about the forms used in the pay procedures. To alleviate this condition, procurement contracting officers were requested to utilize the fast payment clause in purchase orders. This helped, but it did not solve the problem because it required a contractor's certification which was not accomplished in a great many cases. Contractors must scrutinize every new procedure and comply with every new instruction if the new system is to get off to a good start. This should be easy, for the main effort of this consolidation is to simplify and to provide straight and swift channels of communication.

From a management viewpoint, the uniformity, standardization and orderliness which can be achieved in field contract administration organizations can provide, for the first time, the capability for a qualitative evaluation of the job that is being done in the field management of contracts.

For industry, the changes mean a single agency of the Government to deal with the contractor instead of multiple Government offices making individual demands, often for the same information.

Project 60 has a real stake in the DOD cost reduction program. Substantial cost benefits to both Government and industry are expected from the cumulative actions that have been taken to improve policy direction and control at the Secretary of Defense level, provide uniform policies and procedures and reduce multiple DOD representation in contractor facilities. Of even more significance is the savings industry can expect in both direct and indirect costs from these actions.

The chart below shows the proposed consolidated region headquarters and the time periods for their planned conversion. The Philadelphia region, consolidated under the Defense Supply Agency last September, is not included in this chart.



AF Engineering Data

(*Continued from Page* 2)

now expect compliance from the aerospace industry. No longer will the practice of submitting "swiss cheese" drawings be permitted. The required level of design disclosure will be enforced. Data submitted with limited rights to the Government will be used within the fair framework of prenegotiated rights. With considerably fewer drawings delivered, the inspectors and development engineers can do a more thorough job of insuring technical adequacy.

New techniques in the 375 series of regulations, i.e., configuration management, program definition, are compatible with and implemented by 310–1 procedures. Indeed, 310–1 acts as a discipline over multiple, conflicting and overlapping data requirements imposed by the parent documents.

Strangely, data has not drawn much attention from top industry management. This is probably due to two factors: first, data is largely produced as a side product of the main task of designing, developing and building equipment; second, costs of furnishing data tend to be classed in overhead without extensive cost analysis. As the Government continues to emphasize data as an expensive product which must be carefully managed by data specialists, this attitude should change. A top level Data Management Conference is scheduled for May 26–27, 1965. The purpose of this meeting, which will be sponsored by DOD and hosted by the National Security Industrial Association, is to motivate corporate executives to recognize the need for better formal communication between the Government and industry so that our mutual goals can be more readily attained.

The Air Force has drastically reduced the requirements for data on contracts. Where possible, data requirements are tailored to the contractor systems. Since the government now requires considerably less data, it is anticipated that the prime contractor will likewise impose stringent controls to insure that the flow of paper from his vendors is the minimum essential. The prime contractors can no longer justify undue detail when the DD Form 1423 clearly implies that the Air Force doesn't need it. When this system is fully implemented, contractor supplied data should be reduced by several quantum levels. One contractor reported that he is delivering one-tenth of his previous required paper work.

It should be readily apparent that, as the quantity of data is reduced, the quality will increase. All users of data must justify how they use it, the impact if they don't get it, and what decisions are made as a result of getting it. Consequently, visibility is increased and the vital flow of management information is no longer choked by minutiae. System Program Directors will recognize that surveillance over the contractor is easier and more effective because it is based on need. Data now becomes the feedback loop for control—the nerve system of successful program management.

Cooperation in Equal Employment Program Cited

The following businesses and organizations have been cited by the Director, Equal Employment Opportunity Program of the DOD for cooperation under Title 7 of the Civil Rights Act of 1964, which seeks to overcome discriminatory employment practices:

American Airlines; Aluminum Company of America, Badin, N. C.; General Electric Lamp Plant, Newark, N. J.; Texas A & M College; Ingalls Shipbuilding Corp., Pascagoula, Miss.; Todd Shipyards Corp., New Orleans, La.; Hotpoint Division of General Electric Co., Chicago, Ill.; Frito-Lay Co., Brentwood, Md.; Sunshine Biscuit Co. facility, Dayton, Ohio; American Chicle Co., Long Island City, N. Y.; Hunt Food & Industries, Atlanta, Ga.; Mauney Hosiery Co., Kings Mountain, N. C.; Erwin Mills, Erwin, N. C.; Union Bag-Camp Paper Corp., Savannah, Ga.; Texaco, Port Arthur, Tex.; Gulf Oil Corp., Port Arthur, Tex.; American Tobacco Co., Durham and Reidsville, N. C.; Brown & Williamson Tobacco Co., Winston Salem, N. C.; Liggett & Myers Tobacco Co., Durham, N. C.

Tools for the Man in the Sea

(*Continued from Page* 3)

to the powerful corrosive force of sea water. There is a question whether power tools can be sealed to withstand the great pressure of the deep ocean so that they are leakproof.

Pneumatic tools have been used with some success at depths of 50 to 60 feet but at greater depths the additional air pressure required is likely to rule them out. At depths where the water pressure is up to 100 pounds per square inch they would be virtually useless. (This is the pressure at which SEALAB II will be conducted.)

Hydraulic power tools probably offer the greatest promise since leaks would not affect their operation. However, they must be simple and easy to handle, such as incorporating the use of a universal head to which instruments for cutting, turning or hammering can be attached. At the present time, no such tool is yet in sight.

Actually, the experience of SEALAB II should throw more light on the problem of designing undersea tools. It is hoped, for example, that included in the crew will be divers who are also electrical and mechanical engineers and who can observe firsthand the conditions liable to be encountered by undersea "mechanics." During SEALAB II a variety of tasks will be performed with tools now available in order to clarify these problems. Even so, what we learn at a depth of 250 feet may not necessarily apply at all at depths of 500 feet or beyond.

Aquanaut and a surface support diver engaged in gathering marine biological samples. The aquanaut is breathing the same helium-oxygen mixture as that inside the SEALAB.

SEALAB diver at work alongside the submersible decompression chamber.

It is clear that there will be a prolonged experimental period before useful operations at deep depths can become routine. The obstacles are so great and our knowledge is so limited of both the deep sea environment and man's ability to function in it that the challenge seems as formidable as the conquest of space.

The gain in the long run, however, appears to justify the effort. The Navy's undersea operations demand a salvage and submarine rescue capability far greater than we have today. Also, man's ability to be at home in the deep ocean environment can lead to radically new military tactics and strategy. Finally, man's conquest of the deep will add immeasurably to his knowledge of his own world so that he can better understand and regulate the environment which surrounds him.

BIBLIOGRAPHY

Defense Procurement Circular No. 22, Jan. 29, 1965. Revision of ASPR 1-1707.1; Selected Items Based on GAO Reports and DOD Replies Relating to DOD Procurement Policies and Practices.

Defense Procurement Circular No. 23, Feb. 10, 1965. Termination of Plant Cognizance Procurement and Policies to be Followed After Such Termination; DOD Instruction 4105.59, dated Oct. 13, 1964, Subject: DOD Contract Administration Services Plant Cognizance Program; List of Plans Currently Under the DOD Contract Administration Services Plant Cognizance Program; Extension of Mandatory Effective Date for Section XIII, Government Property—Revision 8, dated Nov. 1, 1964.

Defense Procurement Circular No. 24, Feb. 26, 1965. Rights in Technical and other Data and Copyrights.

Each Defense Procurement Circular (DPC) is designed to place new or changed policies or procedures in effect prior to publication of an Armed Services Procurement Regulation (ASPR) revision. The items in each circular are cancelled after six months, unless specifically eliminated earlier by a new DPC or by publication in the ASPR. ASPR subscribers will receive Defense Procurement Circulars through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

DOD Instruction 7300.5 "Use of Letters of Credit for Financing Grants, Contributions and Other Programs, Dec 2, 1964. Provides for the use, by all components of the DOD, of letters of credit as a means of financing grants, contributions and similar programs. In order to minimize the impact of premature withdrawals from the U.S. Treasury, letters of credit ordinarily will be utilized for advance financing of DOD programs carried out by (1) State or local governments and (2) educational and other institutions, including international organizations of which the U.S. is a member.

DOD Directive 4140.25, "Management of Petroleum Products," Jan. 6, 1965. Delineates responsibilities for the supply management of petroleum products and services related thereto.

DOD Directive 7060.3, "International Balance of Payments Program—Nonappropriated Fund Activities," Jan. 16, 1965. Sets forth policy and procedures governing Armed Services Exchange purchase of foreign goods and services by DOD nonappropriated fund activities (including nonappropriated concessionaire activities) outside the U.S., its possessions, and Puerto Rico, and construction, repair and maintenance of such activities.

DOD Instruction 7045.2, "DOD Programming System; Procedures for Program Changes," Jan. 29, 1965. Provides specific procedural guidance for the preparation, submission, review, evaluation and resolution of Program Change Proposals (PCP's) in support of the DOD Programming System.

DOD Instruction 7045.3, "DOD Programming System; Program Element Summary and Descriptive Data Sheets," Jan. 29, 1965. Provides specific procedural guidance in support of DOD Programming System for the preparation and submission of program element summary and descriptive data sheets to reflect approved programs or approval of program changes by the Secretary of Defense.

DOD Instruction 7045.4, "DOD Programming System; Procedures for Updating the Five-Year Force Structure and Financial Program (FYFS&FP)", Jan. 29, 1965. Provides procedural guidance and technical specifications for the submission of program change data in machine readable form in support of DOD Programming System.

DOD Instruction 5030.32, "Planning Procedures for Construction Projects in the National Capital Region," Feb. 10, 1965. Prescribed DOD policies and procedures to be followed by the Military Departments in submitting plans for projects proposed for construction in the National Capital Region (NCR), to the National Capital Planning Commission (NCPC) and the Commission of Fine Arts (CFA) for review.

DOD Directive 5160.51, "Time and Time Interval Standards and Calibration Facilities for Use by Department of Defense Components," Feb. 1, 1965. Establishes policy and assigns responsibility to a single DOD component for establishing, coordinating and maintaining capabilities for time and time interval (astronomical and atomic) for use by all DOD components, DOD contractors, and related scientific laboratories.

DOD directives and instructions may be obtained from:

Publications Distribution Branch
Office of the Secretary of Defense
Room 3B938, The Pentagon
Washington, D.C. 20301

Air Force Logistics Pamphlet No. 70-2, "Competition with Confidence Management Handbook," Dec. 14, 1964. Contains a general outline of the "Competition With Confidence" program, including a brief history which sketches its development from a unilateral Air Force program in 1955 to the present AFLC/AFSC Regulation 57-6, which utilizes the skills of both industry and Air Force.

DOD Engineering for Transportability Program, Dec. 1964. (Joint Service publication—AR 705-8, NAVMATINST 4600.5A, AFR 80-18, MCO 4610.14.) Establishes the responsibility and functions of the Transportability Agencies and prescribes policies and procedures for accomplishing the DOD Engineering for Transportability Program. The objective of this program is to assure that items of materiel are so engineered, designed and constructed that the required quantity can be efficiently transported.

DOD Incentive Contracting Guide, Jan. 19, 1965. (Joint Service publication—FM 38-34, NAVMAT P-4283, AFP 70-1-5, DSAH 7800.1.)

NAVMATINST 4000.15, "Management of Technical Data and Information in the Department of the Navy," Nov. 20, 1964. Incorporates into a single publication comprehensive statements of policy and procedures to govern the management of technical logistics data and information within the Department of the Navy.

Military Service publications may be obtained from the Service contract administration office administering company contracts.

Conference on New Technology. Contains several papers presented at the Conference on New Technology, which was held at the Lewis Research Center, Cleveland, Ohio, June 4-5, 1964, on the technology that makes our Nation's space flights possible.
Catalog No. NAS 1.21:5015 $1.00

Satellite Communications (Military-Civil Roles and Relationships). Prepared by the Military Operations Sub-Committee of the Committee on Government Operations, 88th Congress, 2nd session, this report reviews six years of Government effort in promoting, planning, designing and developing communications satellites. It attempts to identify the basic policy issues in a complex and complicated field of Government activity and to recount what has been done to resolve

(*Continued on Page* 21)

NOTES FOR EDITORS

Editors seeking copies of speeches with appropriate photographs or additional information on any of the following article ideas are invited to contact the Chief, Magazine & Book Branch, Office of Assistant Secretary of Defense (Public Affairs), Washington, D.C. 20301, telephone: OXford 7-8010.

OUR PEAR-SHAPED, FOUR-CORNERED WORLD

Scientists at Johns Hopkins Laboratory working with the Navy satellite program have learned more about the physical shape of the earth in the past three years than man previously had learned in the last two hundred years. Through Navy satellites it is now known that the earth actually is pear-shaped with the southern hemisphere larger than the northern. There are literally four corners of the earth located near Peru, Ireland, New Guinea and south of Africa. This means the surface of the oceans is not level; and it is known that sea level at Dublin, Ireland, is 150 yards higher than sea level at Charleston, S.C. There are many other interesting facets to this newly acquired knowledge. For example, through a doppler study of satellites, the distance between Pt. Hueneme, Calif., and Fort Wayne, Ind., has been measured to within seven yards of the geodetic ground survey of the earth.

BIG BUSINESS IN TRAINING DEVICES

Advancements in technology have had a direct effect on the complexities of military weapons systems and the men who man them. This, coupled with increased costs in operating more advanced systems, has led to the development of synthetic training devices. The building and selling of training devices constitutes a billion-dollar-a-year industry in the United States. The Air Force, one of the major users, spends more than $100 million annually on the procurement of these devices in order to maintain proficiency. These devices range from simple "part-task" trainers to realistic replicas of our most sophisticated aircraft. Interest-trainers which substitute for the more expensive and dangerous method of operating real systems include the celestial trainer for navigators, the ultra-sonic radar-observer trainer, the B–52 and B–70 simulators, missile launch trainers and space simulators which enable trainees to experience a space voyage.

NAVAL OBSERVATORY PROBES UNIVERSE

Naval scientists at the Flagstaff, Ariz., Naval Observatory, using a new 61-inch astrometric telescope, are discovering new data concerning the moon and stars not previously known. Some of these scientific advancements include: the most complete study made so far of the evolution of the stars through research in galactic clusters; the photographing and cataloging of faint stars to within 100 light years; first successful use of super cooling of photographic emulsion to increase sensitivity so that color photos may be obtained of galaxie ; and relocation of 20 of the 28 known periodic comets sighted in the last five years. In addition, it is believed that the Flagstaff Observatory will provide the best pictures of the U.S. manned landing on the moon.

RESEARCH & DEVELOPMENT SPIN-OFF BENEFITS INDUSTRY

The DOD spending for research and development has provided many tangible benefits to industry. Much of the basic knowledge learned through defense research and development is applicable to industry but the continuing problem has been how best to disseminate this information. Some examples of beneficial spin-off to industry are: original research by a Michigan University team that determined that chromium-doped rubies provide necessary characteristics for Masers (the Maser is an important component of the Telestar Communications Satellite); the basic causes of motion sickness and means for controlling it have been developed through aerospace medical research; the automobile safety belt commonly used today largely owes its existence to the rocket sled experiments conducted by Air Force Colonel John Paul Stapp; and high-speed voice transmissions reveal that persons with throat abnormalities can be easily identified.

MEDICAL LABORATORY FOR ARMY SPECIAL FORCES

A portable medical laboratory developed for Army Special Forces will enable personnel to perform tests under extreme climatic field conditions. Packed in a lightweight nylon fabric case, it weighs 30 pounds, contains three plastic trays that include microscope, centrifuge, drugs and reagents needed for basic lab procedures. It can be carried on a man's back or dropped by parachute. The packet will float and remains waterproof even when weighted and submerged for as long as two weeks.

NEW AIR FORCE MUSEUM PLANNED

The present Air Force Museum at Dayton, Ohio, was founded in 1923. It was closed during the war and reopened in 1954. That year 10,000 people visited the museum. In 1963 the attendance reached 529,000. An annual attendance of 1,000,000 is forecast for 1970. The building now being used was formerly an aircraft engine overhaul shop. A new Air Force Museum will be constructed on a 200-acre tract of land at the western edge of Wright-Patterson Air Force Base, east of Dayton, Ohio. A canopy or roof supported at four suspension points by huge steel pylons embedded in the ground will cover approximately eight acres or five city blocks. The Air Force Museum Foundation, a non-profit organization, is now actively engaged in a national campaign for funds to finance the construction of the new museum. The goal for the campaign is a minimum of $10 million dollars. Gifts will be solicited from corporations, businesses, individuals, organizations and foundations. Opening ceremonies are scheduled for early 1967.

Artist's Conception of Air Force Museum

CALENDAR OF EVENTS

April 22–23: Quarterly Meeting of Committee on Military Exports, Defense Industry Advisory Council, Room 1E801, The Pentagon.

April 29: Annual Meeting of Property Administration Assn., at Hotel New Yorker, New York, N.Y. For information contact: Jack Griffiths, General Precision, Inc., 1500 Main Ave., Clifton, N.J.

May 1–5: International Congress of Astroscience, Los Angeles, Calif.

May 3–5: American Society of Quality Control Convention, Los Angeles, Calif.

May 3–9: National Science Fair—International, Kiel Auditorium, St. Louis, Mo. For information contact: Dr. Norman R. D. Jones, 5310 Lindenwood, St. Louis, Mo.

May 9–14: Electrochemical Society Conference, San Francisco, Calif.

May 10–14: National Conference on Peaceful Uses of Space, Sheraton-Jefferson Hotel, St. Louis, Mo. For information contact: Frank S. Purviance III, McDonnell Aircraft Corp., St. Louis, Mo.

May 12–14: Annual National Forum of American Helicopter Society, Washington, D.C.

May 16–19: American Institute of Chemical Engineers Conference, San Francisco, Calif.

May 16–22: Aviation/Space Writers Assn. Annual Meeting, Albuquerque, N.M.

May 18–21: American Petroleum Institute Conference, Houston, Tex.

May 21–June 1: Exercise CHEROKEE TRAIL V, Ft. Bragg, N.C.

May 25–27: Armed Forces Communications & Electronics Convention, Washington, D.C.

Armed Forces Day to be Celebrated Week of May 8-16, 1965

The Department of Defense celebrates the sixteenth annual observance of Armed Forces Day on May 15, 1965. In order to attain maximum public and military participation, the Department will be host to the American public and our international neighbors during the period May 8–16, when the Armed Forces invite the people of the world to view and inspect this nation's defense capabilities and military readiness.

"Open House" events will be the principal feature of Armed Forces Day observances at all military posts, camps, stations, bases and defense facilities. Exhibits, exercises, parades, maneuvers and demonstrations will provide the American public the opportunity to view and inspect the preparedness of their Armed Forces, and the people of the world the occasion to see first-hand the strongest U.S. peace time military organization in history.

Power for Peace, the Armed Forces Day slogan for the past 11 years, symbolic of our national policy, will continue to be used.

Information on national, state or local plans for the 1965 Armed Forces Day observances, May 8–16, may be obtained from any headquarters of the regular or reserve components of the Armed Forces or from the National Coordinator, Armed Forces Day, Office of the Assistant Secretary of Defense (Public Affairs), Room 2E772, The Pentagon, Washington, D.C. 20301.

Nils A. Lennartson Dep. Asst. Sec. Def. for Public Affairs Resigns

Nils A. Lennartson

Nils A. Lennartson has resigned as Deputy Assistant Secretary of Defense for Public Affairs, effective April 10, 1965.

Mr. Lennartson has accepted appointment as President of the Railroad Progress Institute and assumed his new duties in Chicago in mid-April.

Appointed Deputy Assistant Secretary of Defense for Public Affairs January 17, 1961, Mr. Lennartson was nominated by the Department of Defense for a Rockefeller Public Service Award in 1964.

Mr. Phil Goulding, military reporter for the *Cleveland Plain Dealer*, was named Mr. Lennartson's successor. Mr. Goulding assumed his new duties on April 19.

Bibliography

(*Continued from Page* 19)

them. Communications satellite experiments and the history of Project Advent are contained in the annexes. Catalog No. Y 4.G 74/7:C 73/4 45¢

Publications that require remittance are available for purchase at U.S. Government Printing Office, Washington, D.C.

Army Unfunded Program

(*Continued from Page* 9)

necessary to complete the study. This will include consideration for sponsorship of the company for the "Field of Interest Register" of the Defense Documentation Center. Such sponsorship entitles the company to access to those documents distributed by the Center which are related to their approved studies.

Defense Documentation Center Cuts Costs for Small Firms in R&D

Many small firms having research and development (R&D) contracts with Federal activities are cutting costs through a documentation service provided by the Defense Documentation Center (DDC), Cameron Station, Alexandria, Va., a field activity of the Defense Supply Agency.

DDC assists R&D activities, small or large, by supplying them, without charge, with documents pertaining to past and current efforts in research, development, test and evaluation (RDT&E). Documentation services are available to DOD activities, defense contractors, other U. S. Government activities and their contractors, grantees and potential contractors.

The systematic and timely announcement and availability of technical documents help significantly to prevent and reduce unnecessary duplication of R&D projects and to accelerate the completion and application of research information in order to shorten the "concept-to-delivery" cycle. The DDC document collection totals more than 750,000 different titles, covering all areas of science and technology.

By regulation, 20 copies of all scientific and technical reports generated by defense funding must be submitted to DDC. Exceptions to this requirement are limited to highly sensitive reports and to those reports which have no scientific or technical value. The Center processes and stores the reports for retrieval, announces their availability for official use, retrieves them on request, and supplies copies.

R&D activities having contracts or grants from Federal agencies can register for DDC services by completing the Center's registration form and submitting this form for approval to the Federal office responsible for the project or activity for which service is required. DDC services to registered users can continue for the duration of the contract or grant.

Twice each month the Center publishes and distributes the *Technical Abstract Bulletin* (*TAB*) to more than 6,200 military, industrial, educational and non-profit organizations which are authorized and registered for DDC services. Between 1,500 and 2,500 individual current document announcements are presented in each issue.

Registered users are supplied stocks of pre-punched data processing forms which are used in requesting copies of the documents believed to be pertinent to their current R&D projects. Users may request either hard copies of the documents or microform copies (16– or 35–mm film strips or microfiche).

DDC offers a bibliography search service through which the user receives complete descriptions of selected documents in the collection deemed pertinent to a specific R&D problem.

DDC also provides a referral service to identify, in answer to requests, DOD-sponsored Information Analysis Centers where state-of-the-art information may be obtained regarding specific R&D questions.

Field Services offices operated by DDC receive microfilm copies of all documents as they are obtained by the Center and announced in TAB. In these regional offices R&D personnel of registered user organizations may review the documents and reproduce selected pages on reader-printer equipment. Following is a list of DDC Field Services offices:

John M. Berry, Chief (DDC-OFW)
Cameron Station, Bldg. 5
5010 Duke Street
Alexandria, Va. 22314
Phone: (Code 202) OXford 8-1864

Frank Hennessy, Chief (DDC-OFB)
L. G. Hanscom Field, Bldg. 1210
Bedford, Mass. 01730
Phone: (Code 617) CRestview 4-6100, Ext. 2055

Paul R. Stauffer, Chief (DDC-OFD)
Bldg. 47, Area B
Wright-Patterson AFB, Ohio 45433
Phone: (Code 513) 253-7111, Ext. 35212

George M. Tsujimoto, Chief (DDC-OFL)
Los Angeles Air Force Station
Area B, Bldg. 32-D
Air Force Unit Post Office
Los Angeles, Calif. 90045
Phone: (Code 213) 643-0236

Harold F. Nutzhorn, Chief (DDC-OFN)
346 Broadway, Room 801
New York, N. Y. 10013
Phone: (Code 212) 962-5858

James L. Ferguson, Chief (DDC-OFS)
452 De Guigne Drive
International Science Center
Sunnyvale, Calif. 94086
Phone: (Code 408) 245-4501

Services to DDC users are also available at the following office:

F. E. Croxton, Director
Redstone Scientific Information Center
Bldg. 4484
Redstone Arsenal, Ala. 35809
Phone: (Code 205) 876-6451

For additional information concerning the mission, procedures and services of DDC, write to: Defense Documentation Center, Attn: DDC-PA, Bldg. No. 5, Cameron Station, Alexandria, Va. 22314.

Vice Chairman, New Members Appointed to The Defense Science Board

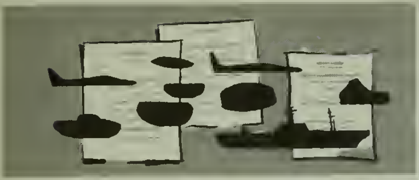
A new vice chairman and four new members have been appointed to The Defense Science Board by Secretary of Defense Robert S. McNamara.

Patrick E. Haggerty, President of Texas Instruments, Inc., Dallas, Tex., succeeds Dr. Allen E. Puckett, Executive Vice President of Hughes Aircraft Co., whose term as vice chairman has expired. Dr. Puckett continues as a member of the board.

The four new members are: Dr. Robert W. Cairns, Director of Research, Hercules Powder Co.; Major General James McCormack, USAF (Ret.), Vice President of the Massachusetts Institute of Technology; Perry W. Pratt, Vice President and Chief Scientist, United Aircraft Corp.; and Dr. Andrew D. Suttle, Jr., Vice President for Research and Professor of Chemistry, Texas A & M University. They succeed four members whose terms also expired last December.

The Defense Science Board is chartered as the senior technical advisory body in the Department of Defense. It is composed of members appointed from civilian life by the Secretary of Defense and of members representing major Federal agencies.

The Board advises the Secretary of Defense, through the Director of Defense Research & Engineering, on scientific and technical matters of interest to the Department of Defense.



DEFENSE PROCUREMENT

Contracts of $1,000,000 and over awarded during month of March 1965:

DEFENSE SUPPLY AGENCY

1—**Humble Oil & Refining Co.**, Houston, Tex. $20,600,187. 240,448,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Standard Oil of California, Western Operations, Inc.**, San Francisco, Calif. $14,846,910. 151,716,400 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**American Oil Co.**, Chicago, Ill. $11,698,482. 120,523,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Continental Oil Co.**, Houston, Tex. $11,191,416. 124,845,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Socony Mobile Oil Co., Inc.**, New York, N. Y. $11,143,392. 125,676,200 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Ashland Oil & Refining Co.**, Ashland, Ky. $7,059,764. 73,535,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Cities Service Oil Co.**, New York, N. Y. $7,022,200. 80,413,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Sunray DX Oil Co.**, Tulsa, Okla. $4,832,637. 54,652,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Signal Oil & Gas Co.**, Houston, Tex. $4,758,800. 58,000,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Suntide Refining Co.**, Tulsa, Okla. $4,349,810. 53,407,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Union Oil Co. of California**, Los Angeles, Calif. $4,279,257. 43,810,200 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Sinclair Refining Co.**, New York, N. Y. $4,122,048. 49,560,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Texaco, Inc.**, New York, N. Y. $3,792,790. 45,586,428 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**California Oil Co. (Standard Oil of Texas)**, El Paso, Tex. $3,693,165. 39,250,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Atlantic Refining Co.**, Philadelphia, Pa. $2,847,300. 31,800,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

Contract Index
Contract information is listed in the following sequence:
Date — Company — Dollar Value — Material—Location
Work Performed—Contracting Agency

—**Douglas Oil Co. of California**, Los Angeles, Calif. $2,342,403. 23,730,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Sun Oil Co.**, Philadelphia, Pa. $2,109,257. 22,260,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Triangle Refineries, Inc.**, Houston, Tex. $1,982,300. 21,500,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**American Petrofina Co. of Texas**, Dallas, Tex. $1,868,750. 19,500,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Shell Oil Co.**, New York, N. Y. $1,542,240. 16,800,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Standard Oil Co. (Ohio)**, Cleveland, Ohio. $1,485,000. 15,000,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Great Northern Oil Co.**, Minneapolis, Minn. $1,429,305. 15,000,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Marathon Oil Co.**, New York, N. Y. $1,397,088. 15,120,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Derby Refining Co. (Div. of Colorado Oil & Gas Corp.)**, Wichita, Kan. $1,234,130. 15,000,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Hunt Oil Co.**, Dallas, Tex. $1,044,000. 12,000,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Kerr-McGee Oil Industries, Inc.**, Oklahoma City, Okla. $1,015,000. 12,500,000 gallons of jet fuel. Defense Fuel Supply Center, Washington, D. C.

2—**Delta Petroleum Co.**, New Orleans, La. $3,499,716. 9,109,125 gallons of lubricating oil. Defense Fuel Supply Center, Washington, D. C.

5—**Eastman Kodak Co.**, Rochester, N. Y. $1,365,996. 27,039 rolls of aerial film. Rochester. Defense General Supply Center, Richmond, Va.

12—**Standard Oil Co. of California, Western Operations, Inc.**, San Francisco, Calif. $1,852,154. 358,000 gallons of automotive gasoline and 14,929,000 gallons of diesel oil. Defense Fuel Supply Center, Washington, D. C.

15—**Sportwelt Shoe Co., Inc.**, Nashua, N. H. $1,946,970. 646,836 pairs of combat boots. Nashua and Newport. N. H. Defense Clothing & Textile Supply Center, Philadelphia, Pa.

22—**Vitro Minerals Corp.**, New York, N. Y. $1,137,250. 192,750 tons of coal. Cripple Creek Mine, Suntrana, Alaska. Defense Fuel Supply Center, Washington, D. C.

ARMY

1—**U. S. Rubber Co.**, Mishawaka, Ind. $1,060,244. Rubber fuel tanks for UH-1D IROQUOIS helicopters. Kitchener, Ontario, Canada, and Mishawaka. Army Aviation Command (AMC), St. Louis, Mo.

2—**Bendix Corp., Bendix Radio Div.**, Baltimore, Md. $6,644,891. 112 radio sets (AN/GRC/68 and AN/GRC/66) with ancillary items. Baltimore. U.S. Army Electronics Command (AMC), Ft. Monmouth, N. J.

—**Frank's Dredging Co., Guy F. Atkinson, and Pacific Dredging Co.**, Long Beach, Calif. $1,091,620. Dredging and excavation work on the Ventura Harbor Project. Port Hueneme, Calif. Engineer Dist., Los Angeles, Calif.

—**Blount Brothers Corp.**, Montgomery, Ala. $4,794,000. Construction of the Saturn I second test position at the NASA Test Facility. Hancock County, Miss. Engineer Dist., Mobile, Ala.

—**Beaver State Contractors, Inc.**, Eugene, Ore, $1,056,442. Work on the Blue River Reservoir Project. Eugene. Engineer Dist., Portland, Ore.

—**Sante Fe Engineers, Inc.**, Lancaster, Calif. $1,366,511. Construction of a high temperature loads calibration facility and extension of utilities at the Flight Research Center, Edwards AFB, Calif. Muroc, Calif. Los Angeles Engineer Dist.

3—**White Motor Co.**, Lansing, Mich. $1,236,950. Production Engineer services for 2½-ton trucks. Lansing. U. S. Army Mobility Command (AMC), Warren, Mich.

4—**ITT Corp., ITT Kellogg Communications Systems Div.**, Chicago, Ill. $1,350,000. Two transportable electronic switchboards. Chicago. Electronics Command (AMC), Philadelphia, Pa.

5—**General Dynamics Corp.**, Pomona, Calif. $2,172,777. REDEYE research and development program. Pomona. Los Angeles Procurement Dist. (AMC), Pasadena, Calif.

—**Itek Corp.**, Lexington, Mass. $2,397,505. Design, fabrication and test of a digital mapping system for production of topographic maps from aerial photographs. Lexington. Engineer R&D Labs. (AMC), Ft. Belvoir, Va.

—**Colorado Fuel & Iron Corp.**, Denver, Colo. $2,274,735. Work on the John Day Lock and Dam, Columbia River Project. Minnequa, Colo. Dist. Corps of Engineers, Walla Walla, Wash.

—**Oberg Construction Co.**, Northridge, Calif. $1,097,197. Construction of the Materiel Services Building at the Jet Propulsion Lab. (JPL), Pasadena, Calif., and the relocation of two JPL prefab buildings to the Goldstone Space Center at Barstow, Calif. Dist. Corps of Engineers, Los Angeles, Calif.

8—**R. R. Hensler, Inc.**, Sun Valley, Calif. $7,966,006. Work on the Alamo Reservoir Dam and Appurtenances, Colorado River Basin, Ben Williams River, Arizona Project. Mohave and Yuma counties, Ariz. Dist. Corps of Engineers, Los Angeles, Calif.

9—**General Electric Co., Ordnance Div.**, Burlington, Vt. $1,885,250. Tooling and 7.62-millimeter aircraft machine guns with pods. Burlington. U. S. Army Weapons Command (AMC), Rock Island, Ill.

—**Clement Brothers Co.**, Hickory, N. C. $3,863,722. Construction and excavation work on the Pat Mayse Dam and Reservoir, Sander Creek, Texas Project. Lamar County, Tex. Engineer Dist., Tulsa, Okla.

10—**TRW Space Technology Labs., Inc.**, Redondo Beach, Calif. $1,460,000. Classified research and development. Redondo Beach. U. S. Army Electronics Command (AMC), Ft. Monmouth, N. J.

11—**Union Carbide Corp., Consumers Products Div.**, New York, N. Y. $1,235,977. Dry batteries for tactical radio sets. Chemway, N. C. U. S. Army Electronics Command (AMC), Ft. Monmouth, N. J.

—**Blount Brothers Corp.**, Montgomery, Ala. $5,628,400. Work on the Cross Florida Barge Canal Project. Levy County, Fla. Dist. Corps of Engineers, Jacksonville, Fla.

—**Stolte, Inc.**, Oakland, Calif. $4,509,000. Construction of aircraft control and warning sites in the Republic of Korea. U. S. Army Engineer Dist., Far East.

—**University of Wisconsin**, Madison, Wis. $1,200,000. Operation of a Mathematics Research Center for the U. S. Army. Chicago Procurement Dist. (AMC), Chicago, Ill.

—**Brinkerhoff Drilling Co., Inc.**, Denver, Colo. $1,289,591. Rehabilitation work on power and data facilities, and construction of small support structures at Eielson AFB, Alaska. Dist. Corps of Engineers, Anchorage, Alaska.

12—**General Electric Co.**, Pasco, Wash. $1,927,323. Equipment to be used on the John Day and Little Goose Locks and Dams. Philadelphia, Pa. Dist. Corps of Engineers, Walla Walla, Wash.

—**Mike Bradford & Co., Inc.**, Miami, Fla. $3,232,237. Construction of the Components Service Facility at the NASA Mississippi Test Facility. Hancock County, Miss. Dist. Corps of Engineers, Mobile, Ala.

—**United Aircraft Corp., Sikorsky Aircraft Div.**, Stratford, Conn. $1,500,000. Project definition phase of an Army Advanced Aerial Fire Support System. Stratford. Transportation Research Command (AMC), Ft. Eustis, Va.

15—**Honeywell, Inc., Aeronautical Div.**, St. Petersburg, Fla. $3,336,000. Classified electronics equipment. St. Petersburg. Electronics Command (AMC), Ft. Monmouth, N. J.

—**Norris-Thermador Corp.**, Los Angeles, Calif. $1,724,732. 105-millimeter cartridge cases. Vernon, Calif. Ammunition Procurement & Supply Agency (AMC), Joliet, Ill.

—**Philco Corp., Aeronautics Div.**, Newport Beach, Calif. $1,492,660. Design, development, fabrication and testing for the CHAPARRAL Air Defense System. Newport Beach. U. S. Army Missile Command (AMC), Redstone Arsenal, Huntsville, Ala.

16—**Standard Dredging Co.** and **Great Lakes Dredge & Dock Co.**, New York, N. Y. $3,281,450. Work on the Chesapeake and Delaware River Canal Project. Elk River Section of the canal. Dist. Corps of Engineers, Philadelphia, Pa.

—**Guy F. Atkinson**, Long Beach, Calif. $2,679,970. Work on the San Gabriel River Improvement Project. Long Beach. Dist. Corps of Engineers, Los Angeles, Calif.

17—**Fred R. Comb, Jr., Inc.** Minneapolis, Minn. $1,145,512. Construction of a two-story addition to an existing Logistical Facility Depot at Tinker AFB. Oklahoma City, Okla. Dist. Corps of Engineers, Fort Worth, Tex.

18—**General Motors Corp., Chevrolet Motors Div.**, Detroit, Mich. $1,468,225. 271 motor buses (ambulance conversion). Austin, Tex. and St. Louis, Mo. Army Tank Automotive Center (AMC), Warren, Mich.

—**Clement Brothers Co.**, Hickory, N. C. $15,422,435. Excavation and construction work on the Carters Dam Project. Carters, Ga. Dist. Corps of Engineers, Mobile, Ala.

19—**Kaiser Jeep Corp.**, Toledo, Ohio. $1,698,187. 984 ¼-ton utility trucks. Toledo. Army Tank Automotive Center (AMC), Warren, Mich.

22—**Honeywell, Inc., Ordnance Div.**, Hopkins, Minn. $1,110,533. Bomb dispensers for the Air Force. Hopkins. Ammunition Procurement & Supply Agency (AMC), Joliet, Ill.

23—**General Dynamics Corp., General Dynamics/Pomona**, Pomona, Calif. $16,384,822. A classified quantity of REDEYE guided missiles. Pomona. Los Angeles Procurement Dist. (AMC), Pasadena, Calif.

—**General Dynamics Corp., General Dynamics/Pomona**, Pomona, Calif. $6,648,776. Engineering services for REDEYE missile program. Pomona. Los Angeles Procurement Dist. (AMC), Pasadena, Calif.

24—**Josanco, Inc.**, Tonawanda, N. Y. $1,184,145. Work on flood protection at Smokes Creek, Lackawanna, New York Project. U. S. Army Engineer Dist., Buffalo, N. Y.

—**Armstrong Co., Inc.** and **Anderson Construction Co.**, Ames, Iowa. $3,983,819. Work on the Marion Dam and Reservoir, Cottonwood River, Kansas Project. Tulsa Dist. Corps of Engineers, Tulsa, Okla.

—**Brookfield Co., Inc.** and **Baylor Construction Corp.**, New York, N. Y. $8,083,075. Work on the Hurricane Barrier, Stamford, Connecticut Project. Stamford. U. S. Army Engineer Div., New England, Waltham, Mass.

—**General Motors Corp., Detroit Diesel Engine Div.**, Detroit, Mich. $3,007,200. 1,200 diesel engines. Detroit. Army Tank Automotive Center (AMC), Warren, Mich.

—**Heil Co.**, Milwaukee, Wis. $7,669,815. 825 semitrailers. Milwaukee. Army Tank Automotive Center (AMC), Warren, Mich.

—**Benson Mfg. Co.**, Kansas City, Mo. $2,903,655. 1,074 stainless steel tanks. Kansas City. Edgewood Arsenal, Edgewood, Md.

25—**Stevens Mfg. Co.**, Ebensburg, Pa. $1,420,055. 5,220 ¼-ton cargo trailers. Ebensburg. Army Tank Automotive Center (AMC), Warren, Mich.

—**Remington Arms Co., Inc.**, Bridgeport, Conn. $2,362,512. 5.56mm cartridges. Bridgeport. Frankford Arsenal (AMC), Philadelphia, Pa.

26—**Firestone Tire & Rubber Co.**, Akron, Ohio. $1,820,012. Shoe assemblies for M48 and M60 tanks. Noblesville, Ind. Procurement Dist. (AMC), Cleveland, Ohio.

—**Great Lakes Dredging & Dock Co.**, New York, N. Y. $1,994,000. Dredging work on the Chelsea River and Boston Harbor Project. Boston, Mass. U. S. Army Engineer Div., New England, Waltham, Mass.

—**General Motors Corp., Allison Div.**, Indianapolis, Ind. $1,389,180. Transmissions (TX–100–1) for use in various vehicles. Indianapolis. Procurement Dist. (AMC), Cincinnati, Ohio.

—**McKenzie Construction Co.**, San Antonio, Tex. $1,729,850. Construction of a composite recruit training and housing facility at Lackland AFB. San Antonio. Dist. Corps of Engineers, Fort Worth, Tex.

—**Chamberlain Corp., Scranton Army Ammunition Plant**, Scranton, Pa. $3,516,775. 155mm projectiles. Scranton. Procurement & Supply Agency (AMC), Joliet, Ill.

29—**Norcoast Constructors, Inc.** and **Morrison-Knudson, Inc.**, Seattle, Wash. $4,222,780. Construction of support and technical facilities in connection with an underground project and maintenance and operation of a camp site at Amchitka Island, Alaska. Dist. Corps of Engineers, Anchorage, Alaska.

—**Amron Corp.**, Waukesha, Wis. $1,478,474. Cartridge cases for the 20mm gun for the Air Force. Waukesha. Frankford Arsenal (AMC), Philadelphia, Pa.

—**Lincoln Winn, Jr.**, Orinda, Calif. $1,567,733. 100 units of family housing at Presidio of San Francisco, Calif. Dist. Corps of Engineers, Sacramento, Calif.

—**Raytheon Co.**, Lexington, Mass. $8,907,548. Design and development of the HAWK missile system. Bedford, Mass. U. S. Army Missile Command (AMC), Redstone Arsenal, Huntsville, Ala.

30—**Guy F. Atkinson**, Long Beach, Calif. $4,536,814. Excavation and construction work on the Coyote Creek Channel Project. Sante Fe Springs, Calif. Engineer Dist., Los Angeles, Calif.

—**Sandkay Construction Co., Inc.**, Ephrata, Wash. $1,919,481. Construction and excavation work on the Dorshak Dam and Reservoir Project. Ahsahka, Idaho. Dist. Corps of Engineers, Walla Walla, Wash.

—**Kaiser-Jeep Corp.**, Toledo, Ohio. $4,310,656. 209 5-ton trucks of various body types. South Bend, Ind. U. S. Army Mobility Command (AMC), Warren, Mich.

31—**United Aircraft Corp., Hamilton Standard Div.**, Broad Brook, Conn. $1,178,068. 65 manual telephone central office sets (AN/TTC–7). Broad Brook. U. S. Army Electronics Command (AMC), Ft. Monmouth, N. J.

—**Admiral Corp.**, Chicago, Ill. $2,589,222. 1,833 radio sets. Chicago. U. S. Army Electronics Command (AMC), Ft. Monmouth, N. J.

—**Peter Kiewit Sons Co.** and **Al Johnson Construction**, Omaha, Neb. $16,484,500. Construction work on the Arkansas River and Tributaries Project. Little Rock, Ark. U. S. Army Engineer Dist., Little Rock, Ark.

—**Stevens Mfg. Co.**, Ebensburg, Pa. $1,415,810. 5,219 ¼-ton, 2-wheel cargo trailers. Ebensburg. Army Tank Automotive Command (AMC), Warren, Mich.

—**Dale Building Co.**, Beverly Hills, Calif. $2,730,680. Construction of 190 family housing units at Fort Ord. Monterey, Calif. U. S. Army Engineer Dist., Sacramento, Calif.

—**Buxmont Ordnance Co.**, a subsidiary of the **J. W. Rex Co.**, Landsdale, Pa. $2,862,873. Ordnance items. Berwick, Pa. Ammunition Procurement & Supply Agency (AMC), Joliet, Ill.

—**Martin Marietta Corp.**, Orlando, Fla. $1,957,000. Improved Program Test Station research and development, engineering and production prototypes for the PERSHING weapon system. Orlando. U. S. Army Missile Command (AMC), Huntsville, Ala.

—**Thiokol Chemical Corp.**, Bristol, Pa. $1,269,453. Loading, assembling and packing of signal equipment. Long Horn Ammunition Plant, Marshall, Tex. Ammunition Procurement & Supply Agency (AMC), Joliet, Ill.

—**U. S. Rubber Co.**, New York, N. Y. $1,086,217. Lay-away maintenance and support services at the Joliet Ammunition Plant. Joliet, Ill. Ammunition Procurement & Supply Agency (AMC), Joliet, Ill.

—**Motorola, Inc.**, Scottsdale, Ariz. $1,394,720. 26 radar data transmitting sets; 26 test fabrication kits; 16 radar data receiving sets, and ancillary items. Scottsdale. U. S. Army Electronics Command (AMC), Ft. Monmouth, N. J.

NAVY

1—**AVCO Corp.**, Richmond, Ind. $4,957,584. Arming and fuzing devices for POLARIS missiles. Richmond. Special Projects Office.

—**Sparton Electronics Div., Sparton Corp.**, Jackson, Mich. $2,307,379. Sonobuoys and associated equipment. Jackson. Bureau of Naval Weapons.

2—**General Dynamics Corp.**, Pomona, Calif. $79,634,615. TERRIER/TARTAR missiles. Pomona. Bureau of Naval Weapons.

3—**Triumph Storecrafters Corp.**, Houston, Tex. $2,536,800. Construction of 112 36-foot amphibious assault boats. Channelview, Tex. Bureau of Ships.

4—**Reed & Martin International, Inc.**, Honolulu, Hawaii. $1,395,000. Construction of an enlisted mens club at the U. S. Naval Station, Pearl Harbor, Oahu, Hawaii. Dist. Public Works Officer, 14th Naval Dist., Bureau of Yards & Docks.

—**Northrop Corp., Nortronics Div.**, Anaheim, Calif. $1,071,923. POLARIS missile checkout and readiness equipment. Anaheim. Special Project Office.

5—**Alaska Puget United Transportation Co.** (a joint venture composed of the Alaska Barge & Transport Co., Vancouver, Wash., and Puget-United Transportation Co., San Francisco, Calif.). $14,300,000. Five-year contract for the annual resupply of U. S. installations in the Alaska-Aleutians area. The installations include sites of the Distant Early Warning line. Military Sea Transportation Service.

—**Ling-Temco-Vought, Inc., Range Systems Div.**, Dallas, Tex. $21,925,774. Modification, renovation, and repair of two existing range instrumentation ships for use as APOLLO recovery ships. Dallas and the Avondale Shipyards, Inc., New Orleans, La. Bureau of Ships.

—**Western Electric Co.**, Winston-Salem, N. C. $6,044,500. Engineering and installation of oceanographic research stations. Winston Salem. U. S. Navy Purchasing Office, Washington, D. C.

—**Hughes Aircraft Co.**, Fullerton, Calif. $3,500,000. Major components of the Naval Tactical Data System which will be installed aboard Navy ships. Fullerton. Bureau of Ships.

8—**Litton Systems, Inc., Data Systems Div.**, Canoga Park, calif. $1,350,750. Spare parts to support the digital realtime computer used on the E–2A aircraft. Canoga Park. U. S. Navy Aviation Supply Office, Philadelphia, Pa.

—**Edward R. Marden Corp.**, Allston, Mass. $3,449.000. Construction of a mess hall at the U. S. Naval Station, Newport, R. I., and construction of an officer's candidate school dormitory at the U. S. Naval Base, Newport, R. I., Newport. Dist. Public Works Officer, 1st Naval Dist., Bureau of Yards & Docks.

—**Woods Hole Oceanographic Institution**, Woods Hole, Mass. $1,300,000. Research in the field of oceanography. Woods Hole. Office of Naval Research.

—**Technical Appliance Corp.**, Sherburne, N. Y., $1,024,693. Research in design, fabrication, installation and testing of antenna systems. Elephant Butte, N. M. and in Sherburne. Office of Naval Research.

9—**Heyward-Robinson Co., Inc.**, New York, N. Y. $1,190,007. Construction of an enlisted men's barracks at the U. S. Naval Submarine Base, New London. Groton, Conn. Dist. Public Works Officer, 3rd Naval Dist., Bureau of Yards & Docks.

—**Grumman Aircraft Engineering Corp.**, Bethpage, Long Island, N. Y. $34,200,000. C–2A aircraft and associated equipment. Bethpage. Bureau of Naval Weapons.

—**North American Aviation, Inc., Columbus Div.**, Columbus, Ohio. $6,000,000. OV–10A COIN aircraft. Columbus. Bureau of Naval Weapons.

—**Northrop Corp., Nortonics Div.**, Anaheim Calif. $7,323,000. 26 monitor and fault localizer test sets for use on radar and sonar equipment aboard naval ships. Anaheim. Bureau of Ships.

—**General Dynamics Corp., Electric Boat Div.**, Groton, Conn. $54,754,390. Construction of two nuclear powered attack submarines. Groton. Bureau of Ships.

—**Newport News Shipbuilding & Drydock Co.**, Newport News, Va. $56,974,000. Two nuclear powered attack submarines. Newport News. Bureau of Ships.

10—**Lockheed Aircraft Corp.**, Burbank, Calif. $1,480,832. Oceanographic research study in connection with sonar capabilities. Burbank. Bureau of Ships.

—**Wickes Industries, Inc.**, Camden, N. J. $4,254,048. 50 transportable electronics shops for field maintenance of radar and radio equipment. Camden. Marine Corps.

12—**Knapp-Stiles, Inc.**, Grand Rapids, Mich. $4,478,000. Construction of 300 family housing units at the Naval Station, Treasure Island, Calif. Dist. Public Works Officer, 12th Naval Dist., Bureau of Yards & Docks.

15—**Northwestern Motor Co.**, Eau Claire, Wis. $2,142,294. 535 aircraft towing tractors. Eau Claire. U. S. Navy Purchasing Officer, Washington, D. C.

16—**Control Data Corp.**, Rockville, Md. $1,130,011. Three digital plotter systems and 132 page printers, together with disk file storage units, repair parts, and technical manuals for use at Control Center Computers at various naval shore installations. St. Paul, Minn. Bureau of Ships.

17—**Technical Material Corp.**, Mamaroneck, N. Y. $1,560,471. Radio transmitters (AN/FRT 62) for use at Naval shore stations. Mamaroneck. U. S. Navy Purchasing Office, Washington, D. C.

18—**Norge Associates, Inc**, Manhasset, N. Y. $1,026,000. Construction of a fleet ballistic missile squadron administration building at the U. S. Naval Submarine Base, New London. Groton, Conn. Dist. Public Works Officer, 3rd Naval Dist., Bureau of Yards & Docks.

19—**National Bulk Carriers, Inc.**, New York, N. Y. $7,500,000. Use of the tanker SS AMTANK for five consecutive years. The 556-foot tanker of 23,584 tons will be used by MSTS in world-wide service for carrying petroleum products. MSTS.

—**Lockheed Missile & Space Co.**, Sunnyvale, Calif. $2,342,243. An exploratory research effort on the POSEIDON missile. Sunnyvale. Special Projects Office.

22—**General Dynamics Corp., General Dynamics/Pomona Div.**, Pomona, Calif. $1,033,064. Research and development work on TERRIER/TARTAR missiles. Pomona. Bureau of Naval Weapons.

—**Collins Radio Co.**, Cedar Rapids, Iowa. $1,592,298. 184 antenna multicouplers for use on general purpose communications equipment on naval ships. Cedar Rapids. Bureau of Ships.

23—**Loral Electronic System Div. of Loral Electronic Corp.**, New York, N. Y. $1,674,310. Computers for use in submarine detection aboard the S–2E antisubmarine warfare aircraft. New York. U. S. Navy Purchasing Office, Washington, D. C.

—**Boeing Co., Vertol Div.**, Morton, Pa. $1,351,295. Miscellaneous spare parts for the CH–46A and UH–46A helicopters. Morton. U. S. Navy Aviation Supply Office, Philadelphia, Pa.

24—**R. G. Webb, Inc.**, Riverside, Calif. $1,960,000. Construction of 140 family housing units at the Marine Corps Base, Camp Pendleton, Calif. Dir., South West Div., Bureau of Yards & Docks.

—**Texas Instrument Inc., Science Service Div.**, Dallas, Tex. $5,604,937. A marine geophysical and oceanographic survey of the eastern and central north Atlantic Ocean and the Norwegian and Mediterranean Seas. The high seas. U. S. Naval Oceanographic Office, Washington, D. C.

—**Alpine Geophysical Associates, Inc.**, Norwood, N. J. $5,811,447. A marine geophysical and oceanographic survey of the western north Atlantic Ocean and the eastern and central north Pacific Ocean. The high seas. U. S. Naval Oceanographic Office, Washington, D. C.

—**Ling-Temco-Vought, Inc., LTV Vought Aeronautics Div.**, Dallas, Tex. $6,761,200. Conversion of RF–8A aircraft to an RF–8G configuration, and associated equipment. Dallas. Bureau of Naval Weapons.

—**Norris Thermador Corp.**, Los Angeles, Calif. $3,363,745. Bomb bodies for Navy aircraft. Vernon, Calif. U. S. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Sperry Rand Corp., Sperry Gyroscope Co.**, Great Neck, N. Y. $3,500,000. Engineering and development services for modifications to TERRIER missile radar sets and ancillary equipment. Great Neck. Bureau of Naval Weapons.

26—**United Aircraft Corp., Hamilton Standard Div.**, Windsor Locks, Conn. $2,667,954. Propeller assemblies and associated equipment for Navy aircraft. Windsor Locks. Bureau of Naval Weapons.

30—**H. L. Coble Construction Co.**, Greensboro, N. C. $6,030,000. Construction of 440 family housing units at the Naval Station (WILLOUGHBY). Norfolk, Va. Dir. Atlantic Div., Bureau of Yards & Docks.

—**General Dynamics Corp., Electric Boat Div.**, Groton, Conn. $45,623,162. Construction of two ammunition ships (AE). Quincy, Mass. Bureau of Ships.

—**Bath Iron Works Corp.**, Bath, Maine. $43,754,100. Construction and delivery of three guided missile destroyers (DDG) being purchased by West Germany. Bath. Bureau of Ships.

—**Midwestern Instrument, Inc.**, Tulsa, Okla. $1,677,108. Tape recorders for use on naval ships. Tulsa. Bureau of Ships.

31—**Teledyne Systems Corp.**, Hawthorne, Calif. $13,840,000. Development of the Integrated Helicopter Avionics System (IHAS). Hawthorne. Bureau of Naval Weapons.

—**G. A. Goodwin**, Boulder, Colo. $1,460,563. Construction of 100 family housing units at the Marine Corps Air Station. Yuma, Ariz. Dir., Southwest Div., Bureau of Yards & Docks.

—**McDonnell Aircraft Corp.**, St. Louis, Mo. $22,708,000. F4B aircraft. St. Louis. Bureau of Naval Weapons.

—**Republic Aircraft Corp.**, Farmingdale, N. Y. $1,052,500. A POLARIS ship control trainer. Farmingdale. Special Projects Office.

AIR FORCE

2—**AiResearch Mfg. Co.**, Phoenix, Ariz. $1,186,650. Gas turbine engines. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**North American Aviation, Inc., Autonetics Div.**, Anaheim, Calif. $1,330,000. Maintenance and repair of MINUTEMAN guidance and control equipment. Anaheim. Ballistics Systems Div. (AFSC), San Bernardino, Calif.

3—**O.M.I. Corp. of America**, Alexandria, Va. $1,031,958. Analytical photogrammetric plotter groups. Detroit, Mich. Rome Air Development Center (AFLC), Griffiss AFB, N. Y.

—**Sylvania Electric Products, Inc.**, Waltham, Mass. $2,999,997. Work on the MINUTEMAN ground electronics system. Buffalo, N. Y., and Waltham and Needham, Mass. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**General Electric Co.**, Philadelphia, Pa. $1,000,000. Work on the advanced re-entry program. Philadelphia. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

4—**Philco Corp., Aeronutronic Div.**, Newport Beach, Calif. $1,500,000. Research and development of a payload ejection mechanism. Newport Beach. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**Aerojet-General Corp.**, Sacramento, Calif. $3,153,000. Research and development for the TITAN III transtage engine. Sacramento. Space Systems Div. (AFSC), Los Angeles, Calif.

—**General Investment Co.**, Longview, Wash. $2,260,000. Construction of 150 family housing units at McChord AFB, Tacoma, Wash. Base Procurement Office, McChord AFB.

5—**Boeing Co.**, Seattle, Wash. $7,700,000. Research, development, test and engineering for modernization of Wings I through V of the MINUTEMAN weapon system. Seattle. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**Boeing Co.**, Wichita, Kan. $2,395,000. Services and support for B–52 aircraft. Wichita. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**Radio Corp. of America, Defense Electronics Products**, Moorestown, N. J. $16,445,657. Satellite tracking radar for the Ballistic Missile Early Warning System. Moorestown. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Bedford, Mass.

—**General Motors Corp.**, Indianapolis, Ind. $1,820,396. Component improvement program for the T–56 series engine. Indianapolis. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

8—**General Electric Co., Evendale Plant**, Cincinnati, Ohio. $3,650,354. Compressor kits and technical data for J-79 engines. Cincinnati. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**IIT Research Institute**, Chicago, Ill. $4,310,830. Operation of an electromagnetic analysis center for space studies. Annapolis, Md. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Bedford, Mass.

—**North American Aviation, Inc.**, Columbus Div., Columbus, Ohio. $1,304,400. Missile procurement. Columbus. Air Proving Ground Center (AFSC), Eglin AFB, Fla.

—**Northrop Corp., Norair Div.**, Hawthorne, Calif. $1,156,452. Spare parts for F–5 series aircraft. Hawthorne. Middletown Air Materiel Area (AFLC), Olmsted AFB, Pa.

9—**Boeing Co.**, Seattle, Wash. $1,252,000. Aerospace ground equipment, training equipment and spare parts for MINUTEMAN Wing VI. Seattle. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**Boeing Co.**, Seattle, Wash. $1,088,900. Missiles and related equipment for the sixth MINUTEMAN wing. Seattle. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**Northrop Corp.**, Hawthorne, Calif. $3,662,669. F–5 series aircraft, including mobile training units and maintenance data. Hawthorne. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**Martin Marietta Corp.**, Baltimore, Md. $1,500,000. Integration and installation of government-furnished equipment to convert KC–135 aircraft to RC–135 configuration. Baltimore. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

10—**Space Corp.**, Dallas, Tex. $1,304,544. Aircraft engine test stands. Dallas. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**General Electric Co.**, Cincinnati, Ohio. $1,857,410. F–4 aircraft ground equipment. Cincinnati. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**Hughes Aircraft Co.**, Culver City, Calif. $2,732,348. Spare components for an air/ground digital communications system. Culver City. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

11—**TRW Space Technology Labs., Inc.**, Redondo Beach, Calif. $3,200,000. Work on space programs. Redondo Beach. Space Systems Div. (AFSC), Los Angeles, Calif.

—**General Dynamics/Convair, General Dynamics Corp.**, San Diego, Calif. $1,196,120. Spare parts in support of the ATLAS/AGENA booster program. San Diego. Space Systems Div. (AFSC), Los Angeles, Calif.

—**Boeing Co.**, Seattle, Wash. $2,000,000. Modification of RC–135 aircraft. Seattle. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

12—**Cleveland Pneumatic Tool Co.**, Cleveland, Ohio. $1,047,046. Components for B–52 landing gears. Cleveland. Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

—**General Dynamics Corp.**, Fort Worth, Tex. $1,769,053. Engineering services in support of B–58 aircraft. Fort Worth. San Antonio Air Materiel Area (AFLC), Kelly AFB, Tex.

—**Sylvania Electric Products, Inc.**, Waltham, Mass. $3,905,500. Technical publications program for MINUTEMAN ground electronic systems. Buffalo, N. Y., and Waltham and Needham, Mass. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

15—**Philco Corp.**, Philadelphia, Pa. $2,086,632. Radio communication equipment. Philadelphia. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Bedford, Mass.

—**Belock Instrument Corp.**, College Point, N. Y. $4,247,778. Radar and aerospace ground equipment for C–141 and C–130 aircraft. Lawrence, Mass. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**General Electric Co.**, West Lynn, Mass. $8,000,000. Component improvement engineering for J–85 and T–58 series engines. West Lynn. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**North American Aviation, Inc.**, Los Angeles, Calif. $1,693,725. Services and materials for modification of F–100 series aircraft. Palmdale, Calif. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

16—**North American Aviation, Inc.**, Los Angeles, Calif. $1,093,950. Aircraft wing fuel tanks. Los Angeles. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

—AVCO Corp., Stratford, Conn. $2,934,316. A component improvement program for T–55 series engines. Stratford. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**General Motors Corp.**, Indianapolis, Ind. $1,214,664. T56–A–15 engines and related material. Indianapolis. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**Douglas Aircraft Co., Inc., Missiles & Space Systems Div.**, Santa Monica, Calif. $1,000,768. Launch support services for space programs at Vandenberg AFB, Calif. Space Systems Div. (AFSC), Los Angeles, Calif.

17—**General Electric Co.**, Philadelphia, Pa. $1,477,794. Research and development of the MARK 12 re-entry program. Philadelphia. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**Bell Aerospace Corp., Bell Aerosystems Co.**, Buffalo, N. Y. $2,500,000. Work on prototype rocket engines. Niagara Falls, N. Y. Space Systems Div. (AFSC), Los Angeles, Calif.

—**TRW Space Technology Labs. of Thompson Ramo Wooldridge, Inc.**, Redondo Beach, Calif. $1,188,610. Technical and engineering services in support of TITAN II. San Bernardino, Calif. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**Aerojet-General Corp., Astrionics Div.**, Azusa, Calif. $2,000,000. Modification and instrumentation of KC–135 aircraft. Azusa. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

18—**Univac Div., Sperry Rand Corp.**, Washington, D. C. $4,852,370. Electronic data processing systems. Philadelphia, Pa. 2750th Air Base Wing Hq. (AFLC), Wright-Patterson AFB, Dayton, Ohio.

—**Lear-Siegler, Inc.**, Grand Rapids, Mich. $1,955,622. Aircraft gyroscopes and spare parts. Grand Rapids. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**Hallicrafters Co.**, Chicago, Ill. $1,550,000. Work on a classified project. Chicago. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**Collins Radio Co.**, Cedar Rapids. Iowa. $1,059,870. Communications and navigation equipment for HC–130 and A–1E aircraft. Cedar Rapids. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**General Electric Co., Re-entry Systems Dept.**, Philadelphia, Pa. $2,326,000. Development and test of space vehicles. Philadelphia. Space Systems Div. (AFSC), Los Angeles, Calif.

19—**Philco Corp.**, Willow Grove, Pa. $1,200,000. A combat operations center computer and related equipment. Willow Grove. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Bedford, Mass.

—**International Business Machines Corp.**, Washington, D. C. $4,185,234. Electronic data processing equipment Poughkeepsie, N. Y. 2750th Air Base Wing Hq. (AFLC), Wright-Patterson AFB, Dayton, Ohio.

—**Douglas Aircraft Co., Missiles & Space Systems Div.**, Santa Monica, Calif. $5,538,283. Calendar year 1965 launch support services at Vandenberg AFB, Calif. Space Systems Div. (AFSC), Los Angeles, Calif.

—**General Electric Co.**, West Lynn, Mass. $8,000,000. Component improvement program for T–64 series engines. West Lynn. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**General Motors Corp.**, Indianapolis, Ind. $12,089,031. T–56 series engines and related equipment. Indianapolis. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**Curtiss-Wright Corp.**, Caldwell, N. J. $1,862,662. Equipment to modify C–133 propellers. Caldwell. Warner Robins Air Materiel Area (AFLC), Robins AFB, Ga.

22—**Fairchild Camera & Instrument Corp.**, Syosset, N. Y. $1,562,600. Aircraft cameras. Syossett. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

24—**Collins Radio Co.**, Cedar Rapids, Iowa. $6,191,450. Aircraft communication equipment. Cedar Rapids. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Mass.

—**Litton Systems, Inc., Guidance & Control Systems Div.**, Woodland Hills, Calif. $3,011,688. Spare parts for the navigation system on the F–4 series aircraft. Woodland Hills. Middletown Air Materiel Area (AFLC), Olmsted AFB, Pa.

26—**Lockheed Missiles & Space Co.**, Sunnyvale, Calif. $4,834,000. AGENA–D launch services for Eastern and Western Test Ranges during calendar year 1965. Space Systems Div. (AFSC), Los Angeles, Calif.

—**North American Aviation, Inc., Autonetics Div.**, Anaheim, Calif. $179,018,913. Components for the improved MINUTEMAN guidance system. Anaheim. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

29—**Hughes Aircraft Co.**, Culver City, Calif. $5,000,000 Modification of air weapons control interceptor systems in F–106 aircraft. Culver City. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**Martin Marietta Corp.**, Denver, Colo. $5,364,800. Follow-on TITAN II missiles and instrumentation range safety system kits. Littleton, Colo. Ballistic Systems Div. (AFSC), Noron AFB, San Bernardino, Calif.

30—**North American Aviation, Inc., Autonetics Div.**, Anaheim, Calif. $12,173,918. Spare parts for MINUTEMAN guidance system. Anaheim. Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

—**Hycon Mfg. Co.**, Monrovia, Calif. $3,000,000. Spare parts for the KS–72 camera system. Monrovia. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

31—**Collins Radio Co**, Cedar Rapids, Iowa. $3,596,799. Integration and installation of subsystems for the 484–L communications systems. Cedar Rapids. Electronics Systems Div. (AFSC), L. G. Hanscom Field, Mass.

—**Aerodex, Inc.**, Miami, Fla. $3,374,563. Overhaul of R–4360 engines. Miami. San Antonio Air Materiel Area (AFLC), Kelly AFB, Tex.

ARPA Selects Three Contractors for Materials Research Programs

The Defense Department's Advanced Research Projects Agency has selected three contractors for programs of research in the materials field. The contracts will be awarded through the Military Services.

These contracts are unusual because in each case an industrial laboratory and a university will join forces to advance a field of materials technology of major interest to the DOD.

The contractors and the major fields of investigation are:

- Martin Co., Denver Div., will subcontract with the University of Denver and conduct a three-year program of research on the high energy rate forming of metals. This contract will be for approximately $1,000,000.
- Union Carbide Corp. will subcontract with the Case Institute of Technology and the Bell Aerospace Corp., and conduct a three-year program of research on carbon composit materials. This contract will be for approximately $2,500,000.
- Monsanto Research Corp. will subcontract with Washington University, St. Louis, Mo., and conduct a two-year program of research on high performance composites. This contract will be for approximately $2,000,000.

The science developed at the universities as well as the science developed in the industrial laboratories and elsewhere will be systematically and speedily applied to developing new materials and new processes. This "coupling" of science to applications will assist in developing the stronger, lighter, more versatile materials important to national defense.

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US/UK Plan Joint Development of Advance Lift Engine

In keeping with the objective of expanding cooperation in research and development with our allies, the United States and the United Kingdom are now investigating the possibility of negotiating a joint development program for an advanced lift engine for vertical and short take-off and landing aircraft (V/STOL).

There is a verbal understanding on the desirability of such a joint program and there is considerable hope that the economic and technical incentives will overcome some of the "legal wrinkles" that have hampered expansion of cooperative R&D in the past.

Last summer an agreement was signed between the two countries for a research program on the use of beryllium in aircraft engines. The beryllium project differs from the proposed lift engine program in that there is no end product or hardware and the legal business aspects are of lesser significance.

Work on evolving a joint development program is going on at two different levels. The technical objectives and planning are being worked out by the U.S. Air Force and the British Ministry of Aviation. Concurrently, representatives of the DOD Office of General Counsel and the Office of the Assistant Director of Defense Research & Engineering (International Programs) are discussing the business aspects with the Ministries of Defense and Aviation of the U.K.

The mechanics of getting a U.S. contractor together with a British firm do present some problems but it is believed that these can be resolved with the end product being a combination of the best of the two technologies. The U.S. is planning on extensive use of the technology generated in the light-weight gas generator demonstrator programs being carried out at present and foresees similar inputs from the British firm (Rolls-Royce) which has actively been producing lift engines as well as carrying on extensive developmental work in this area.

Neither the U.S. nor the U.K. have firm operational requirements for such an advanced lift engine but are entering into this joint development with the belief that an engine normally must lead aircraft development by one or two years. The main U.S. considerations for the present are for the use of such an engine in an airframe resulting from the U.S.-West Germany V/STOL studies directed toward a possible joint advanced V/STOL tactical fighter weapon system. Use is also foreseen in the application of lift engines in future military and possibly commercial transport aircraft.

DSA Supply Center Consolidation

The Defense Supply Agency (DSA) has initiated consolidation actions affecting five of its Supply Centers which is expected to produce a net savings of 521 jobs and reduce the Agency's operating costs by $6 million annually.

A new Defense Personnel Support Center will be formed in Philadelphia, Pa., which will consolidate in one organization the Defense Clothing and Textile Supply Center, Philadelphia; the Defense Medical Supply Center, Brooklyn, N.Y.; and the Defense Subsistence Supply Center, Chicago, Ill. The new center is expected to become operational in July 1965.

An additional consolidation is being effected through the transfer of inventory control functions for packaged petroleum, industrial gas cylinders, and chemicals, formerly assigned to the Defense Fuel Supply Center, Washington, D.C., to the Defense General Supply Center, Richmond, Va. Procurement of chemicals and industrial gas cylinders is also being transferred to the Richmond facility.

The procurement of packaged petroleum products and bulk fuels will continue as a function of the Fuel Supply Center in Washington.